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GUAYULE—A SOURCE OF RUBBER, AND A NEW CROP FOR AMERICAN FARMERS

By J. FRANCIS MACBRIDE
ASSOCIATE CURATOR OF THE HERBARIUM

A hundred miles or so south of San Francisco near the town of Salinas, on the flat fertile floor of the irrigated valley of the same name, there are now growing thousands of gray-green guayule shrubs, North America's native rubber plant.

In a previous article (*Field Museum News*, vol. 14, no. 1, p. 4, Jan. 1943) the history and beginnings of this project were outlined. Here I shall try to give some idea, more particularly, of the knowledge of the plant itself as obtained by the hundred or more plant scientists—botanists if you please, in a broad and for that matter in a real sense—who have devoted time to studying it during the past two and a half years. The progress they have made in its development or domestication, so to speak, and its potential importance as a farm crop, improved by science for man's needs, will also be discussed.

GUAYULE PLANTS IN SECOND GROWING SEASON

Photograph of a field on the government tract in the Salinas Valley, California. (Furnished by the Bureau of Plant Industry, Soils and Agricultural Engineering, United States Department of Agriculture).

In the preparation of this informal report, I have had the assistance of Dr. A. C. Hildreth, plant physiologist, and Dr. Reed C. Rollins, geneticist of the Guayule Research Project, Bureau of Plant Industry, Soils and Agricultural Engineering, who with acute understanding described and interpreted on the Salinas tracts and in the extensive laboratories, their research and that of their associates. I also had the privilege of being accompanied by Willis Linn Jepson, professor of botany emeritus, University of California. As in the case of the previous article I am indebted to Mr. E. L. Perry, assistant to the director, Emergency Rubber Project, for kindly editing and approving officially.

Botanically, guayule is a kind of Parthenium (*P. argentatum*); it is of the same family of plants as chrysanthemum, the artichoke and dandelion, the last incidentally closely related to one of the plants Russia has grown as a source of rubber. There are numerous species of Parthenium, and one of them is so similar and so closely related to guayule that it sometimes hybridizes with it. This plant, known as mariola, (*P. incanum*), is greatly inferior, however, as a source of rubber since its pith and medullary rays contain none, but merely lignify, while in guayule nearly all parenchyma tissue is gorged with rubber; on the other hand, mariola is more hardy and more vigorous.

Hybrids between the two species may show this desirable feature in their more luxuriant growth. At present, discounting some interesting experiments with subtropical species that are tree-like in habit, part of the permanent improvement of guayule may result, it seems, from a proper blending of the selected desirable characters of these two species, the characteristics not useful to man or necessary for the plant in cultivation being modified or eliminated.

Now how is modern scientific knowledge and technique accomplishing this miracle? Probably only an idea can be given the layman because the processes are involved and the terms used to describe them are foreign to common experience. But one may say that in this case the scientist is aided by two fortuitous circumstances: (1) reproduction in many of these plants is asexual, i.e., viable seeds develop without pollination, so that every type remains true; and (2) the inherent genetic variability is wide, the chromosome count, with a usual of 72, varying from 36 to 180 or more.

However, certain types of guayule are completely sexual and dependent on pollination so that hybridization may be easily accomplished. These facts simply mean that the student can take his materials, that is, the almost infinite products of interbreeding, and then by proper controls add or subtract characteristics almost at will and create a new plant (given of course the needed time), as it were, which will approach closely the ideal plant envisioned and will reproduce its kind.

This may take a few years, but that is nothing compared to the tens of thousands of years that nature and (or) man by chance or happy selection have needed in the development of fruits and vegetables such as dates, corn or cabbage. For in all probability as suggested in these pages recently (vol. 15, nos. 7–8, p. 2, July–Aug. 1944) in an article on the wild cabbage, the genetic makeup was such that, given outlet or play, so to speak, through interbreeding, selection, climatic factors etc., something equivalent to modern man's planned works has come now and then to pass.

In such transformation nowadays the

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botanist knows pretty accurately at any time just where he and the subject, the plant, are "at," to put it colloquially. A striking example of this was shown us in some fields of guayule where now and then a dwarf shrub was extremely conspicuous by virtue of its small size. These poor specimens can be eliminated because they are now known to be the product of an excessive number of chromosomes, usually with a count of well over 100, instead of the normal 72 common to the species.

This comes about by the fertilization of a non-reduced ovule. The occurrence is natural, yet certain wild areas lack the forms that may produce such undesirable individuals. The difficulty in this case is circumvented by the selection of plants which do not "pile up" their chromosomes during the process of seed production.

GREAT POTENTIALITIES

The government project, now being gradually liquidated, has obviously not only contributed importantly to the needs for natural rubber, but has laid a basis for the establishment of a new crop of great potential worth. There are two factors involved that emphasize this: The first has to do with its unique physical position as a farm crop, and the second with its unique position as a source of rubber.

(1) Guayule succeeds in a climatic range 2,400 miles long, 100–150 miles wide, roughly from Red Bluff, California to Brownsville, Texas, and although native to limestone soils it grows well in neutral ones and is acid tolerant. This means that its cultivation is economically feasible on idle and insufficiently watered lands where it may live for a known thirteen years and probably much longer; irrigated it may yield about one ton of rubber per acre in four to five years.

It would be ideal as a soil conserving crop for its climatic area, and would be harvestable, if desired, in two years. In this way, it would take care of the quiet period, now known to be necessary for many lands with a minimum of water and care. In Texas alone there are more than 3,000,000 acres suitable for it, much of it uncleared brushland now used only for grazing. The present project at its maximum totaled 32,000 acres.

(2) Its usefulness as a source of a *unique* rubber type, counsels earnestly for its permanent introduction into our crop economy. It is now known to improve the workability of synthetic rubbers even more than the addition of Hevea rubber because it is more plastic. Addition of 25 per cent guayule reduces mixing time as much as 25 per cent; in other words a considerably greater output is possible by the addition of a small amount of guayule rubber for certain processing operations. It is even used in admixture with Hevea rubber to improve its plasticity and tack. The importance is emphasized when it is realized that 30 per cent of natural rubber is required even now for the production of large heavy duty tires.

SIMPLIFIED CROPPING

The government specialists have devised and simplified cropping methods. The large bracts and sterile florets which normally adhere to the seeds are now threshed away so that seed storage in a reasonable space is no longer a problem. Machines seed directly into the soil smoothly and evenly, transplant seedlings, do a large share of the weeding and harvest the end product. Finally, there is good evidence that the new guayule plant will be cropped by mowing, for it has been discovered that in one year the old root will produce new growth, yielding rubber equal in amount to a two-year-old seedling.

For decades we have been seeking and introducing new crops; guayule is one in which we have invested some $30,000,000. It seems obvious that we should encourage its farm-growing by giving the farmer the same protection he now has for his cattle, sugar, wool and other products. It is certainly economically sound to subsidize in order to encourage production and crop diversification where the product will always be a potential need in the national independence.

The amazing job done to date on guayule has entailed the close co-operation of as many as one hundred and twenty-five technicians from the Bureau of Agricultural and Industrial Chemistry; Bureau of Plant Industry, Soils and Agricultural Engineering; Forest Service, and Bureau of Entomology and Plant Quarantine. Included in the work have been foresters, plant pathologists, entomologists, physiologists, cytologists, geneticists, agronomists, and taxonomists. The result is a dramatic achievement by students of plants. May we have the good sense, the vision, to give the encouragement necessary to perpetuate the benefits already obtained.

LEAFLET ON ALEUTIAN ISLANDERS ISSUED BY MUSEUM

Aleutian Islanders is the title of a new anthropology leaflet published by the Museum. The Aleutian Islanders, or Aleuts as they were called by their Russian discoverers, were Eskimos who had achieved a rather spectacular culture or civilization. The leaflet describes this civilization as it existed before the Russian conquest in 1741.

Before the coming of the White men, there were about 16,000 Aleuts in the Aleutian Islands and the Alaska Peninsula. They spoke a divergent dialect of the Eskimo language, but lacked many cultural traits of northern Eskimos. For instance, the relatively mild climate of the Aleutians prohibited the use of dog-sled traction and the techniques of hunting and fishing on the ice, all of which were very important to Eskimos elsewhere.

The Aleuts killed their whales by means of poison, a method of hunting completely foreign to northern Eskimos. Aleut whaling lances were smeared with aconite poison made from aconite root. Lone hunters in their small, skin-covered kayaks would

ALEUT MASKS

Carved from wood, and used in various ceremonies. An illustration from the new leaflet "Aleutian Islanders," drawn by Helen Z. Quimby.

approach a large whale, cast their poisoned lances, and then return to their villages. After several days the whale would die and eventually drift ashore. By watching the wind and tides the hunter could tell where the whale would be washed ashore. Ownership of the whale was determined by property marks on the lance head in the wound.

The social organization of the Aleuts was strongly influenced by Indians of Alaska and Canada. Their system of kinship and some other customs were more Indian than Eskimo.

Aleut culture, then, is basically old Eskimo with modifications produced by adaptation to a sub-arctic climate and by contact with peoples of northern Asia and American Indians. These factors are in part responsible for the unique culture of the Aleuts which has been described in the new 56-page anthropology leaflet.

The leaflet was written by George I. Quimby, Curator of Exhibits in the Department of Anthropology. It is illustrated with many drawings by Helen Z. Quimby and eight photographs from the Museum collections. A striking new format, designed by Lillian A. Ross, Associate Editor of publications, has been used. (Price $ .35).

Museum's First Librarian Dead

Edward L. Burchard, Librarian and Recorder of the Museum in its earliest days, died November 29, at the age of 77. Mr. Burchard left the Museum in 1898 to accept an appointment as chief of the library and archives division of the United States Coast Guard and Geodetic Survey. Later he was director of the school of social service administration at the University of Chicago. In recent years he was consultant to and executive secretary of the Chicago Recreation Commission.

ANTHROPOLOGY—WHAT IT IS, AND HOW IT FITS INTO THE PROBLEMS OF OUR DAILY LIFE

By PAUL S. MARTIN
CHIEF CURATOR, DEPARTMENT OF ANTHROPOLOGY

Most people regard anthropology as an abstract subject which has little or no connection with our daily life. It will surprise many to learn that it has numerous practical aspects. Much of the knowledge acquired by research and field work can be applied to the solving of social problems.

In fact, it is the practical aspects of anthropology—applied anthropology—that make theoretical research in archaeology, ethnology, linguistics, and physical anthropology useful. As in physics and other sciences, theory leads to understanding and ultimately to practical applications.

Anthropologists study man's behavior, institutions, customs, languages, history, and racial divisions so that we may better understand our own society and thus perhaps avoid cultural disintegrations and chaos which produce wars, strikes, depressions, agricultural waste, and other frictions among racial and religious groups.

DEFINITION OF ANTHROPOLOGY

Before explaining how Applied Anthropology works, it seems necessary to define anthropology. The following definition is, in part, attributable to Dr. Eliot D. Chapple of Harvard University:

Anthropology is the science which deals with mankind as a whole and is therefore concerned with the study of human relations among all peoples, including our own society, regardless of time and area. Since the field is broad, it is divided into five branches.

1. *Archaeology* reconstructs human history from earliest times to the present. It deals too with man's rise from earlier forms. It utilizes the buried and fragmentary remains of civilizations (houses, pottery, tools, etc.) to formulate the histories of peoples for whom no written records exist.

2. *Ethnology* describes peoples of the present day. An ethnologist is interested in the relations of man and nature, in the relations of old and young, in the relations between members of a family or members of one society with those of another; in the ways man seeks food and builds his house, makes articles needful for everyday life, and in the way man uses or is influenced by his environment. An ethnologist attempts to obtain a total, well-rounded picture of the culture of the group he has studied.

3. *Linguistics* is concerned with the description, classification, history and trends of languages. A linguist may compare present forms of speech of a given language and thus reconstruct the history of words and the ancient roots from which the modern parts of speech have descended. This helps reconstruct the past of a particular group of people and shows possible linguistic and historical relationships. For example, a study of the Navaho language has proved that the Navaho Indians migrated from their homeland in Canada and are related to Athapascan Indians who still inhabit portions of northern Canada.

4. *Physical Anthropology* is the study of the biological and physical aspects of human races and the growth of individuals. It investigates the earliest appearance of man and his rise from apes, the racial history of man, including fossil man, the description and classification of races; and heredity, evolution and physiological problems which relate to man's behavior.

APPLIED ANTHROPOLOGY

In this article, Dr. Martin defines his science, and tells of some of its applications, or its applicability, in the solution of domestic social problems, as well as world peace. Of particular interest to many will be his description of a serious, thoroughly organized application of anthropological methods to the management-employee relations of a large industrial plant, recently carried out in Chicago.

5. *Applied Anthropology* is the skilled application of a vast body of knowledge to the problems of our own society. This knowledge is concerned with the study and understanding of human relations, social structure, laws of social change and the relationships of personality and culture.

TWO ASPECTS OUTLINED

Applied Anthropology has two important aspects, outlined herewith:

(a) *Biology and mechanisms of human adjustments to human environment:* Man is an organism, and explanation of his behavior, therefore, must be based upon physiological knowledge and laws. He has determinable properties and is continually adjusting to an environment made up of other organisms (human beings) and other natural phenomena. Man's behavior is basically physiological. For example, in speaking of "emotions," one must understand the workings of the autonomic nervous system (which controls involuntary responses) and associated organs (e.g., adrenal glands) as they respond to stimulations from environment.

But, how does this affect human relations? It is by means of a functional relationship between the individual organism (man) and other organisms (other people). By functional relationship I mean that x varies as a function of y. (Thus, the faster you move about, the faster you breathe; or breathing varies as a function of activity.)

The same relationship holds for our everyday life. An employer reprimands a foreman, who then "takes it out" on his men. A father neglects his oldest child and pays more attention to his youngest; the oldest child then rebels against this partiality by manifesting some delinquent behavior (lying, stealing, or misbehaving in general).

STATES OF EQUILIBRIUM

The adjustments of the internal organs and of the organism in general to various stimulations may be defined as maintaining a state of equilibrium. When one runs, the beating of the heart is speeded up; when one stops and rests, the heart slows down and returns shortly to its normal equilibrium.

Likewise, the adjustments of one individual to another or the adjustments of one group to another group produce states of equilibrium. If a father scolds his child the equilibrium existing between these two individuals is disturbed; but after compensatory changes take place, an equilibrium is again established. If war breaks out between groups A and B, the equilibrium is upset; but after peace terms are agreed upon, a new state of equilibrium (at a different level perhaps) will be set up.

Without such adjustments and maintenance of equilibrium an individual or groups of individuals cannot continue to exist. If one does not cure an infection which disturbs his equilibrium, he dies. If an individual cannot adjust easily or at all to other individuals and to society, he becomes unstable and is a neurotic or a psychotic. If groups of people cannot maintain a state of equilibrium, the civilization of one or more groups perishes.

ENVIRONMENTAL EFFECTS

(b) *Human adjustments to natural environment:* The adjustments man, as an organism, makes to other individuals are largely influenced by habits and adaptation to natural environment. By habits, I mean man's methods of making things, his dances, methods of hunting and farming, marriage customs, his language, games, warfare, birth and death rites, art, law, magic, and the like

The anthropologist studies everything concerning man's behavior and his relations to other persons and the way human beings affect each other. Anthropology is interested in comparing human relations both in time and space. That is, we study man today, here or in the Andaman Islands; or we investigate man as he lived 10,000 years ago in Arizona. Such studies provide generalizations or "laws" which are used impartially and carry no judgment as to whether one civilization is higher or lower, better or worse, than another. Each society is evaluated objectively.

By studying the customs and behavior of other folk, we can better understand ourselves and our own problems. Furthermore,

we can work out rules which will hold for primitive peoples and for our society as well. In this way anthropology is of practical use and gives us effective methods of understanding and dealing with people.

HUMAN RELATIONS ARCHAIC

Everyone will recognize our remarkable technological achievements in the past one hundred years in manufacturing, weaving, metallurgy, agriculture, transportation. But there has been no corresponding progress in our methods of understanding and handling people and of controlling our destinies. Our methods of dealing with them are archaic.

We now come to the question: "What good is anthropology?"

Much of the information obtained from archaeology, ethnology, linguistics and physical anthropology is strained and funneled off for use in Applied Anthropology.

And how is it used in a practical way?

One field in which anthropology has played a practical part is "colonial administration"—governing communities made up largely of peoples of different cultures, or of "primitive" people, as we sometimes say. Anthropology is thus used in governing the American Indians of our own country.

AN INDUSTRIAL APPLICATION

But an even wider application has been made in the field of industrial relations. One notable example is the research program carried out by the Western Electric Company of Chicago*.

Western Electric was interested in determining the factors affecting employee efficiency, and improving management-employee relations. A study was made in which a distinctly anthropological point of view was injected by Professor W. Lloyd Warner of the University of Chicago. He was convinced that anthropological field methods could be used for studying an industrial community as well as a primitive one. The Western Electric study is a successful attempt to modernize knowledge concerning human relations, in line with technical advances of the last 200 years.

This study began with a series of experiments on two groups of workers—*a test group* (for whom a given condition was changed) and *a control group* (for whom conditions were kept constant).

Illumination was the first condition to be tested. Lighting was strengthened for both groups, whereupon production increased for both. Then intensity was gradually decreased and production for both groups still continued to rise! Then workers of the test group were allowed to believe that lighting was being increased, although it remained constant. Production remained the same. Then the test group was permitted to believe that illumination was being decreased, although actually it remained the same. Output remained the same.

OUTPUT UNAFFECTED BY CONDITIONS

Various other experiments were tried for more than two years but it became clear that there was no relation between conditions of work and output. Instead, the researchers found that output varied as a function of the relations of the workers to each other and to the management. That is, the fact that the management was interested in making changes was more important than the changes themselves.

The experiments had unintentionally altered the social situation and had improved production because of the added prestige which the test-room girls gained through the attention of the management. The supervision of the groups had been altered, the workers were allowed to talk, to make suggestions, to complain—and these social changes increased output. Rest periods, better lighting and other changes were important primarily as social, not as physical changes. Consulting with and explaining changes to the employees facilitated the accepting of the changes and boosted the worker's morale. Better pay was relatively unimportant as a motivating force in improving output unless the social situation was improved. As a result of these findings, an extensive program of interviewing was inaugurated which gauged the sentiments of the worker, gave him a feeling of participation, and permitted him to "blow off" about his personal problems.

SOCIAL STRUCTURE IN INDUSTRY

These systematic studies at Western Electric and elsewhere have emphasized that industries have social as well as economic structures. In every industrial organization there is on the one hand a formal organization (expressed in the organization chart) which defines groups of personnel according to their technical and economic purposes; and on the other hand an informal social organization of small working groups, each with its own code of behavior and system of sentiments (i.e. beliefs or opinions not based on logic but on emotions).

It has been found that the effective working together of people in a business organization is dependent upon these informal routines and codes of behavior. If the formal structure comes into conflict with this informal social organization, there results a social disequilibrium; that is, there is consequent friction, lack of morale and inefficiency.

In other words, workers, like all human beings, are social animals; and collaboration between them and other workers and the management depends on sentiment, not on logic. If the management desires to improve pay, working conditions, and output, it is necessary to ascertain the established sentiments of the workers; otherwise a new program will fail and may cause friction and even strikes.

TWO CONTRIBUTIONS

Anthropology has contributed to the study and solution of problems of industrial relations in two ways:

The first way is a general viewpoint, which might be called the "functional" viewpoint, that has been gained from the study of the social organization of diverse cultural groups in many parts of the world. In essence, this is the view that social institutions cannot be understood apart from the people who participate in them. Nor can the behavior of an individual be understood without reference to the systems of sentiments possessed by the social groups of which he is a member.

The second way has to do with methods of studying and analyzing the problems of human relations within an industrial organization. These methods were developed during or grew out of innumerable studies of peoples with cultures different from our own; but, because all social groups have important characteristics in common, the methods can be fruitfully applied to our own human problems.

Since the Western Electric study was completed, Applied Anthropology has been used more and more for solving problems of society. By using this science, we can help people to adjust to the conditions of their daily life, both as individuals and groups. We can do something about the major problem of our civilization—that is, we can increase our adjustments to our technological efficiency. Without such a harmonious relationship within groups and between nations, our civilization is doomed.

MUSEUM PROGRAM

We hope to carry on research in Applied Anthropology in this Museum, and to present exhibits which will deal with this subject. Our visitors are familiar with factories, stores, family troubles, political organizations. But, because of the differences between the tools and manufacturing methods of "primitive" peoples, our visitors are unable to understand that there are many similarities between our civilization and that of "primitive" peoples.

Such similarities would be brought out by means of exhibitions. For example, primitive people buy and sell, have political activities and family troubles, depressions and "boom" times and even assembly lines. We would attempt to make clear these similarities between other civilizations and our own. By means of these and other exhibits, we would also like to emphasize that efficient production and distribution of goods are not enough to meet the demands of human nature. The harmonious co-operation of individuals and the social satisfactions derived from that co-operation are also necessary.

*"Management and the Worker" by F. J. Roethlisberger and William J. Dickson. Harvard University Press, 1939.

4-H FARM BOYS AND GIRLS MAKE ANNUAL VISIT TO MUSEUM

Winners of the contests for the annual awards of the 4-H Clubs, brought to Chicago from rural areas all over the United States and Canada at the time of the Fat Stock Show early in December, included, in accordance with the long-established custom of the National Congress of 4-H Clubs, the Chicago Natural History Museum as one of the places to be visited.

On December 4 a group of 500 of the girls was brought to the Museum, and on the next day 400 of the boys. For each group, the James Nelson and Anna Louise Raymond Foundation presented special lectures in the James Simpson Theatre of the Museum, and gave each of the young people a pictorial map indicating the location of the various divisions of exhibits.

4-H CLUB GIRLS AT THE MUSEUM

Typical group on recent visit. At extreme left: Miss Miriam Wood, Chief Lecturer of the Raymond Foundation, whose staff presented special lectures and provided guide service for the 500 girls and 400 boys of rural America brought here by the National Congress of 4-H Clubs at the time of the Fat Stock Show.

The farm youths were then released to tour the building on their own initiative, selecting the exhibits which most interested them as individuals. Members of the Raymond Foundation staff were stationed in the halls, to offer guidance and answer questions.

Staff Notes

Miss Helena Maria da Costa Azevedo, librarian at the Museu Nacional at Rio de Janeiro, is in this country for a year of study in United States libraries, learning their methods, arrangement, cataloging and other sections of their work. She spent September, October and part of November in the Library of this Museum. The Museu Nacional and this Museum have similar problems and subjects with which to work.

Mr. Karl P. Schmidt, Chief Curator of Zoology, recently visited museums in Washington, New York, Cambridge, and New Bedford in the interest of the Museum's Hall of Whales which is approaching completion.

Ensign Loren P. Woods, U.S.N.R., (Assistant Curator of Fishes on the Museum staff) has been transferred from active service in the Philippines to the Military Government School at Princeton University.

Dr. Alexander Spoehr (Curator of North American Archaeology and Ethnology, on leave) has been promoted to Lieutenant (senior grade), U.S.N.R.

Miss Elizabeth Best, on leave from the staff of the Raymond Foundation, has been promoted from Ensign to Lieutenant (j.g.) in the WAVES.

Mr. Melvin A. Traylor, Jr. (Associate, Birds) has been promoted from First Lieutenant to Captain in the U. S. Marine Corps.

Mr. Fred Bromund, who had worked as a volunteer and engaged in considerable research on crocodiles in the Museum's Division of Reptiles, died November 14, as the result of wounds received in action on the German front.

LECTURE TOURS ON WEEKDAYS, JANUARY AND FEBRUARY

Conducted tours of exhibits, under the guidance of staff lecturers, are made every afternoon at 2 o'clock, except Sundays and certain holidays. On Mondays, Tuesdays, Thursdays, and Saturdays, general tours are given, covering all departments. Special subjects are offered on Wednesdays and Fridays; a schedule of these follows:

January

Wed., Jan. 3—Hobby Halls—Indians, Jewels, Jades, and Woods (Mrs. Roberta Cramer).

Fri., Jan. 5—No Stones Unturned—Uses of Stones by Primitive Peoples (Velma Whipple).

Wed., Jan. 10—Dictators Among Animals (Loraine Lloyd).

Fri., Jan. 12—Following the Herd—Life of the World's Herders (Emma Neve).

Wed., Jan. 17—Trees in Winter (Miriam Wood).

Fri., Jan. 19—Fashions in Funerals—Prehistoric, Ancient, and Primitive Methods of Caring for the Dead (Mrs. Roberta Cramer).

Wed., Jan. 24—The Ups and Downs of the Earth—Geological Processes (Velma Whipple).

Fri., Jan. 26—Meet the Mammals (Loraine Lloyd).

Wed., Jan. 31—Ancient Ivories (Emma Neve).

February

Fri., Feb. 2—Head Hunting Not Allowed (Mrs. Roberta Cramer).

Wed., Feb. 7—The Pageant of Winter (Loraine Lloyd).

Fri., Feb. 9—The Pot of Gold—Precious Metals and Stones (Velma Whipple).

Wed., Feb. 14—Say It With Flowers—Valentine's Day (Miriam Wood).

Fri., Feb. 16—Out of the Frying Pan—Kitchenware Through the Ages (Mrs. Roberta Cramer).

Wed., Feb. 21—Natives of Our Southwest—Native People, Plants, and Animals (Velma Whipple).

Fri., Feb. 23—Primitive Professions—Religion, Law, and Medicine (Emma Neve).

Wed., Feb. 28—War in the Wild—Conflict in the Animal World (Loraine Lloyd).

Harris Extension Aids School Play

Plants in Japanese Concentration Camps is the title of a puppet play written by Mrs. Esther Port, home economics teacher of the Belding elementary school, Chicago, and recently performed by her pupils.

Suggestions for the plot, and specimens of the strategic plant materials affected by the war with Japan, were supplied by the N. W. Harris Public School Extension of the Museum.

Chicago Natural History Museum

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THE BULLETIN

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Members are requested to inform the Museum promptly of changes of address.

MUSEUM SCIENCE

The terms *pure science* and *applied science* are frequently used to indicate distinctions that can be made for given conditions at a given time, but which do not hold in final analysis. Another name for applied science is utilitarian science, that is, science that can be put to immediate use in the daily life of civilized man. However, someone has said that "all science is utilitarian" and despite the disturbing developments of the machine age and their application to war, it is difficult to demonstrate that this is not a sound conclusion.

There are many brief definitions of science. One of the best comes not from a scientist, but from a liberal-minded religious leader, Harry Emerson Fosdick, who says that science is "a confidence that truth is discoverable and a faith that it is worth discovering." What is discovered may be immediately practical, it may lie unutilized until further discoveries bring it to application, or it may even never assume any importance except as an item in a web of knowledge leading onward. Perhaps increasing knowledge of certain kinds can be harmful temporarily. Therefore, a proper balance between physical and spiritual values is devoutly to be wished; but it is a poor philosophy which does not admit that man's best destiny lies in a full and accurate understanding of himself and his world.

In this issue of the BULLETIN are two articles on widely different subjects, one botanical and the other anthropological, but both pointing to practical applications of spade work in pure science.

The Chief Curator of Anthropology discusses modern outgrowths of cumulative research in a field which had its beginnings in mere curiosity and one in which the careful recording of simple facts has played a large part. Until quite recently anthropologists were to be found mostly in Museums. Their studies were confined to so-called primitive peoples, and much of their effort and resources were devoted to the accumulation of data, to the gathering of artifacts, and to direct contacts with their subjects in the course of field work.

Now, however, anthropology receives much attention from many institutions of higher learning other than museums. Most of our large universities are staffed with anthropologists both as teachers and researchers, and in some cases their numbers are sufficient to enable them to specialize in directions which heretofore have been and to a considerable extent still are impractical for the museum anthropologist. In anthropology, as in other sciences, the field is now too large to be covered by any one institution. Hence the progress of knowledge is best served by a division of interests in which various institutions contribute along the lines for which they are best fitted.

It is inevitable that certain fields will be left to the museum scientist for the obvious reason that they cannot be mastered without access to the accumulations of concrete material which are only to be found in museums. If the museum scientist neglects these fields they are likely to wither and die and by necessity will have to be revived after a delay which will be costly. Therefore, museum research should be mainly in these fields. How far it can go beyond them must depend upon the resources, the personnel, and the opportunities presented at each place and time.

The museum botanist can scarcely engage in the actual cultivation of guayule to increase the rubber supply; the zoologist has his relations with pathology, medicine, and surgery, but he does not enter into their practice; the geologist who specializes in meteorites contributes something to astronomy, but he does not himself become an astronomer; and the anthropologist, whose subject inosculates with psychology and sociology, cannot enter these fields actively except at the risk of curtailing research that is basic to them.

At least in its research, a natural history museum has its highest responsibility in so-called pure science, leaving the enormous field of applied science to other institutions such as the Museum of Science and Industry, the universities, the special foundations, and the federal agencies. —W.H.O.

Commander Armour Cited

From headquarters of the United States Naval Forces in Europe word has been received that Commander Lester Armour (a Trustee of the Museum) has been awarded the bronze star medal. The medal was awarded by Admiral Harold R. Stark, commander of naval forces in the European theater, for Commander Armour's work in organizing and directing special military activities before and after D-day.

THE MUSEUM HONOR ROLL

Now in the Nation's Service

Army

GEORGE A. RICHARDSON, Trustee—Lt. Col.

CLIFFORD C. GREGG, Director—Colonel, G.S.C.

DR. JOHN RINALDO, Associate, Southwestern Archaeol.—Staff Sgt.

DR. SHARAT K. ROY, Curator, Geol.—Capt.

D. DWIGHT DAVIS, Curator, Anat. and Osteol.—Corp.

BRYAN PATTERSON, Curator, Paleontology—Pfc.

EMMET R. BLAKE, Asst. Curator, Birds—Special Agent, War Dept.

RUPERT L. WENZEL, Asst. Curator, Insects—Capt.

HENRY S. DYBAS, Assistant, Insects—T/5.

WILLIAM BEECHER, Temp. Asst., Zool.—Pfc.

HENRY HORBACK, Asst., Geol.—S. Sgt.

JAMES C. MCINTYRE, Guard—2nd Lt.

RAYMOND J. CONNORS, Guard—Pvt.

FRANK J. DUTKOVIC, Janitor—Pvt.

Navy

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SAMUEL INSULL, JR., Trustee—Lieut. Comdr.

JOSEPH NASH FIELD, Trustee—Lieut.

COLIN CAMPBELL SANBORN, Curator, Mammals—Lieut.

DR. ALEXANDER SPOEHR, Curator, N. Amer. Ethnol.—Lieut.

LOREN P. WOODS, Asst. Curator, Fishes—Ensign

JOHN W. MOYER, Taxidermist—Ch. Specialist (Bur. Aeronautics)

JAMES H. QUINN, Chief Preparator, Paleontol.—Metalsmith 2C

PATRICK T. MCENERY, Guard—Master-at-Arms

GEORGE JAHRAND, Guard—Ch. Water Tender

CLYDE JAMES NASH, Guard—Ch. Gunner

NICHOLAS REPAR, Printer—Aviation Machinist's Mate 1C.

MORRIS JOHNSON, Carpenter—Carpenter's Mate 1C.

HERBERT NELSON, Painter—Painter 1C.

ELIZABETH BEST, Guide-Lecturer—Lieut. (j.g.), WAVES

MARIE B. PABST, Guide-Lecturer—Lieut. (j.g.), WAVES

Marine Corps

MELVIN A. TRAYLOR, JR. Associate, Birds—Capt.

Coast Guard

M. C. DARNALL, Jr., Guard—Lieut. (j.g.)

JOHN MCGINNIS, Guard—Ch. Boatswain's Mate

Other Services

RUDYERD BOULTON, Curator, Birds—Staff of Office of Strategic Services

BRYANT MATHER, Asst. Curator, Mineralogy—Civilian Worker, Corps of Engineers, U.S. Army

LLEWELYN WILLIAMS, Curator of Economic Botany—on special service for U.S. Government

DR. JULIAN A. STEYERMARK, Asst. Curator, Herbarium—field work for Board of Economic Warfare

DR. C. MARTIN WILBUR, Curator, Chinese Archaeol. and Ethnol.—Staff of Office of Strategic Services

Died in Service:

THEODORE ROOSEVELT, Trustee—Brig. Gen., U.S.A.

Served and Honorably Discharged:

JOHN SYCKOWSKI, Guard—Ch. Commissary Stewd., U.S. Navy

MUSEUM PUBLISHES HANDBOOK OF CHICAGO AREA REPTILES

Amphibians and Reptiles of the Chicago Area, a 275-page book illustrated with both color plates and half-tones, was published in December by the Chicago Natural History Museum Press. Clifford H. Pope, Curator of Amphibians and Reptiles, is the author.

COURTSHIP IN THE BOGS

Female swamp tree frog approaching a calling male. An illustration from "Amphibians and Reptiles of the Chicago Area," drawn by Staff Taxidermist Leon L. Pray from a flashlight photograph taken in Homewood, Illinois, by Staff Taxidermist C. J. Albrecht.

The publication is a handbook for laymen, in which technical terms and scientific jargon have been avoided. It is intended for the guidance of those already interested in natural history, and to arouse interest in the reptiles and amphibians of this area on the part of others, states Mr. Pope. By means of its illustrations and the detailed descriptions anyone should be able to identify the fifty-two kinds of reptiles and amphibians which live in the Chicago area (including, for the purpose of this book, fifteen counties in Illinois and Indiana, three in Wisconsin, and one in Michigan.)

"It is surprising that so many reptiles and amphibians live in this area, along with 4 per cent of the entire country's human population," comments Mr. Pope. "Only six states are inhabited by such a large number of people.

"For a region with little variation in altitude, our local area is unusually interesting. This is largely because it lies at the transition zone between hardwood forest and prairie. Many of the local animals found to the west are unknown farther east, and vice versa."

Pictures and descriptions are included of the local salamanders, frogs, and toads, lizards, snakes and turtles. The illustrations include a map, five full-page color plates, seven full-page black and white plates and forty-nine text figures (zinc reproductions of drawings). A decorative cover is the work of Miss Peggy Collings, artist on the Museum staff, who also prepared many of the drawings. Other drawings were contributed by Leon L. Pray, staff taxidermist; photographs are the work of D. Dwight Davis, Curator of Anatomy on leave in Army service, and color plates are by Albert A. Enzenbacher. The book is on sale at the Museum—price $1.75.

JANUARY SUNDAY LECTURES ON "CAVE MAN'S PAST"

To meet undiminished demands, Paul G. Dallwig, the Layman Lecturer of the Museum, will present again one of his most popular subjects—"Digging Up the Cave Man's Past"—on each Sunday afternoon during January.

This lecture has three main divisions: (1) Tracing man's physical evolution; (2) visits to prehistoric groups; (3) the dramatization of a prehistoric murder as it might have occurred according to deductions made from the "corpus delicti," the Museum's skeleton of a Magdalenian young woman, together with the weapon that killed her.

Lectures begin at 3 P.M. (*an hour later than in previous seasons*) in the lecture hall.

The heavy demand by the public, and the necessary limitation of audiences to the accommodations, make it essential to require advance reservations. Lectures are restricted to adults, and children cannot be admitted. *Persons desiring to attend are advised to apply several weeks in advance by mail or telephone* (WABash 9410).

During February, Mr. Dallwig will be on a lecture tour in other cities. However, he will resume lectures at the Museum in March, when his subject will be: "Who's Who in the Jungle Zoo."

Snake Rattle Studies

At the invitation of Dr. Arnold A. Zimmermann, of the University of Illinois School of Medicine, Mr. Clifford H. Pope, Curator of Amphibians and Reptiles, recently attended a regional meeting of the American Association of Anatomists at the University of Wisconsin to give a demonstration of work on the growth of the rattle of the rattlesnakes. Certain aspects of this have but recently been worked out by Messrs. Zimmermann and Pope, although anatomists have studied the sound producing organ for about a hundred years.

HENRY W. NICHOLS RETIRES AS GEOLOGY CHIEF

Although long since eligible for retirement, and suffering from illness for the past several years, Mr. Henry W. Nichols, Chief Curator of the Department of Geology, has remained faithfully at his post, feeling that in the present manpower shortage it was his patriotic duty to do so. He was motivated by loyalty to the cause of science, and to the Museum. He is the dean of the Museum staff, having been a member of it for more than the past fifty years.

Henry W. Nichols

The state of Mr. Nichol's health has finally made his retirement essential, and he left the active service of the Museum on December 31, 1944. He is in his seventy-eighth year.

Mr. Nichols joined the staff in 1894, as Curator of Economic Geology. Since 1936 he has been Chief Curator. He has conducted sixteen expeditions in North and South America for the Museum, collecting a wide variety of material now on exhibition.

Mr. Nichols is the writer of many papers in his field of science. He is a graduate of Massachusetts Institute of Technology, and was a member of the faculty before coming to the Museum.

Dr. Paul O. McGrew, Assistant Curator of Paleontology, has been appointed Acting Chief Curator of the department.

Two Contributors Elected

In recognition of notable gifts to the Museum, Mr. Stuart H. Perry, has been elected to the class of membership designated as Contributors (those whose gifts range in value between $1,000 and $100,000); and the late William F. E. Gurley of Chicago has been posthumously elected a Contributor.

Mr. Perry's gifts have been principally to the Department of Geology and consist of notable meteorite specimens.

Mr. Gurley's gifts, to the Department of Anthropology, include some 3,000 archaeological specimens from various localities.

Technical Publications Issued

The following technical publications have been issued by the Chicago Natural History Museum Press during the last two months:

Zoological Series, Vol. 29, No. 14. *A New Harvest Mouse from Wisconsin.* By Harold C. Hanson. Oct. 26, 1944. $ .10.

Botanical Series, Vol. 23, No. 4. *Studies of Central American Plants—VI.* By Paul C. Standley and Julian A. Steyermark. Nov. 27, 1944. $ .35.

MUSEUM RADIO CITATION

A citation has been awarded to the Museum by the Executive Committee of the School Broadcast Conference, for educational excellence in the recent series of radio programs, "Places and Peoples," presented jointly by the Museum and the Radio Council of the Chicago Board of Education.

The Museum programs dealt with various geographic areas and races, especially upon regions of the world with war significance.

Chiefly responsible for preparation of the programs were Miss Miriam Wood of the Museum's Raymond Foundation, and Mrs. Isabel Callvert of the School Broadcasting Council.

Children's Art Classes

Every Saturday, youngsters—ranging from children of six up to youths of sixteen—boys and girls both, from the Saturday Junior School of the Art Institute can be found at work with stools and easels in odd corners among the exhibits at the Chicago Natural History Museum.

During December, the best results of this activity were shown for public inspection in a special exhibit of chalk drawings and ceramic objects in Stanley Field Hall. The selections were made by instructors.

GIFTS TO THE MUSEUM

Following is a list of some of the principal gifts received during the last two months:

Department of Anthropology:

From: Carter H. Harrison, Chicago—a Chippewa birch bark canoe (Wisconsin) and 10 19th Cent. Bolivian textiles; Lawrence E. Fishleigh, Chicago—a carved piece of kauri gum representing the head of a Maori chief, New Zealand.

Department of Botany:

From: Dept. of Forestry, Belize, British Honduras—52 herbarium specimens, British Honduras; Dr. Fred A. Barkley, Austin, Tex.—29 specimens of algae, Mexico and the U. S.; Charles A. Heath, Chicago—88 color prints and a leaflet on S. African flowering plants; T–5 Henry S. Dybas, U. S.A.—98 herbarium specimens, La.; Dr. B. Elazari-Volcani, Rehovoth, Palestine—48 specimens of algae, Palestine; Mrs. J. M. Stifler, Wilmette, Ill.—587 specimens of fungi, North America; Mrs. John W. Barrett, Freeport, Ill.—2 "palm shoot" canes, Siam; Jose Eugenio Leite, Salvador, Bahia, Brazil—32 herbarium specimens, Brazil; Museo Nacional, San Jose, Costa Rica—80 herbarium specimens, Costa Rica; Harry K. Phinney, Evanston, Ill.—170 specimens of algae, Ill.; Dr. M. A. Brannon, Gainesville, Fla.—18 specimens of algae, Fla.; Dr. Walter Kiener, Lincoln, Neb.—122 specimens of algae, Neb.; Dr. Delzie Demaree, Monticello. Ark.—59 specimens of algae, Ark.; Robert Runyon, Brownsville, Tex.—42 specimens of algae, Tex.; O. C. Durham, North Chicago, Ill.—58 herbarium specimens, western and central U. S.

Department of Geology:

From: C. Wible, Tacoma, Wash.—20 specimens of chalcedony concretions and country rock, Wash.; Ralph L. Lincoln, Chicago—a trilobite, Va.; William E. Menzel, Chicago—a specimen of metahewettite on sandstone, Ariz.; Percy A. Robbins, Chicago—5 mineral specimens, Alaska.

Department of Zoology:

From: Ensign and Mrs. Loren P. Woods, Trenton, N. J.—595 fish specimens, 26 shells, 49 specimens of mollusks and barnacles, 7 millipedes, a garter snake, an alligator lizard, and a tadpole, Calif., Hawaii, and Solomons; Paul Neumann, Chicago—26 amphibians, 3 crayfish, and 31 beetles and allies, N. M.; Sgt. Thane A. Riney, U. S. A.—4 snakes, a lizard, and 2 bats, Ill.; Oden H. Meeker, Port-au-Prince, Haiti—15 lizards, Haiti; T–5 Henry S. Dybas, U. S. A.—a gecko and 100 specimens of shells and crustaceans, Wash. and Hawaii, L. A. Posekany, U. S. A.—3 fish specimens, 6 centipedes, a whip-tailed scorpion, and a beetle larva, Bougainville; Lt. and Mrs. Fred Greeley, Winnetka, Ill.—2 leeches and 5 mites from a bat, Wis.; Lieut. Colin C. Sanborn, U. S. N.—485 land shells and a baby gecko and eggs, Hawaii; Lincoln Park Zoo, Chicago—2 new-born Siberian tigers, an ibis, 6 snakes, and 2 sirens; Chicago Zoological Society, Brookfield, Ill.—an ostrich, 2 monkeys, 2 Gould's monitors, and 10 mites; Boardman Conover, Chicago—3 great-horned owls, Sask., Canada; Maj. W. G. Downs, U. S. A.—94 beetles, 2 bugs, and a biting louse, Bougainville; Delzie Demaree, Monticello, Ark.—58 specimens of shells, Fla. and Ark.; C. J. Albrecht, Homewood, Ill.—a timber wolf and a Virginia deer, Ont., Canada; S. A. Edgar, U. S. A.—24 land shells and crustaceans, Hawaii; J. W. Walls, Chicago—a red fox, Ill.; Mrs. E. A. Mark, Chicago—a hoary bat, Ill.; Lieut. Alvin R. Cahn, U. S. N.—103 specimens of marine invertebrate animals, Aleutians; Maj. H. J. Bennett, U. S. A.—5 fish specimens, Solomons; Pvt. Bryan Patterson, U. S. A.—a dragonfly, Chicago; Cpl. D. D. Davis, U. S. A.—120 insects and allies, Ark. and Calif.; Edwin C. Galbreath, CPhM, U. S. N.—2 fish specimens, S. Pacific; Pfc. William J. Beecher, U. S. A.—11 bats, Solomons; Capt. John A. H. Powell, U. S. A.—4 fish specimens, Sterling Isl.; Pvt. Jerry K. Cordell, U. S. A.—22 frogs, Ga.; U. S. Public Health Service, Hamilton, Mont.—a tick (paratype), Colombia.

Library:

From: U. S. Arctic, Desert, and Tropic Information Bureau, U. S. Army Map Service, New Zealand Legation, and Dr. Henry Field, Washinton, D. C.; Insitituto Botanico da Facultad de Ciencias, Lisbon, Portugal; L. E. Richdale, University of Otago, New Zealand; Dr. Stig Ryden, Gotenburg, Sweden; Enrique Rioja, Chapultepec, Mexico; James Hornell, St. Leonards-on-Sea, England; Gustave A. Fester, Santa Catalina, Argentina; Paul Bellamy, Cleveland, O.; Benjamin F. Howell, Princeton University, N. J.; Nevada Department of Highways, Carson City, Nev.; Timken and Roller, Canton, O.; Stanley Field, Lake Forest, Ill.; Dr. Alfred Rehder, Jamaica Plains, N. Y.; and Boardman Conover, Dr. Fritz Haas, Dr. Paul O. McGrew, Dr. Earl E. Sherff, Henry W. Nichols, Dr. Alfred Emerson, and Charles A. Heath, all of Chicago.

NEW MEMBERS

The following persons became Members of the Museum during the period from October 16 to December 16:

Contributors

William F. E. Gurley,* Stuart H. Perry

Associate Members

David E. Baer, Mrs. Harold G. Barrett, Dr. Edward W. Beasley, James F. Leahy, Miss Edna LeBaron, Miss Hattiemae Quick, Mrs. Arthur J. Utter, Arthur L. Wanner.

Sustaining Members

Emil Eitel

Annual Members

Mrs. Henry D. Aller, Miss Isabel M. Altman, Mrs. Harry C. Bates, James R. Bishop, Marlon Brando, Mrs. Louis C. Braudy, Fred Brinkman, Carl Channon, Oscar A. Cherry, David Chertow, Morton C. Chesler, Arthur T. Clarage, Earl M. Converse, P. J. Dee, G. T. Drake, Mrs. Alfred L. Eustice, Edmund Fairchild, Michael H. Fitpold, L. N. Fleckles, Jr., John T. Gallagher, Dr. Earl Garside, John F. Gilroy, Dr. Emelia J. Giryotas, Myer H. Gladstone, M. Goldschmidt, Mrs. Robert P. Greenlee, Miss Anna E. Gustafson, Miss Ruth M. Gustafson, Clayson J. Hauck, Mrs. Teresa Clary Hughlett, Ralph C. James, C. LeVergne Jones, Kent Jones, H. Donald Kahn, Rev. Niketas Kesses, Miles O. King, Sol C. Kirman, John J. Klickner, Dr. Floyd C. Klier, E. E. Knourek, William M. Knourek, Louis A. Kolssak, Dr. Bernard C. Kolter, William F. Kompare, Herman J. Kramer, William J. MacKenzie, Arthur W. Mall, Mark P. Mamalakis, Abel Marcus, Raymond K. Mathewson, Miss Ada Marie McCarty, Robert G. McGregor, Mrs. William L. McKerrow, Frederick L. McNally, James D. Meers, Thomas J. Murphy, Jr., Dr. John S. O'Connell, Frank M. Opeka, Frank Pendergast, Dr. Peter Petraitis, John Petrie, George J. Pope, Ray W. Preikschat, G. G. Preston, John A. Prosser, John B. Quan, John B. Reynolds, Mrs. Thomas A. Reynolds, Lester N. Rivkin, Mrs. Eldon H. Sager, Oscar L. Scalbom, Mrs. Mario M. Sciaky, Leland W. Short, Dr. Charles Smalley, Miss Mary M. Sullivan, Hector Suyker, Edmund F. Swan, Mrs. Theodore Trautmann, Wirt B. VanSlyke, Miss Kathryn Wade, H. Boyd Weeks, R. B. Weeks, G. L. Winsberg.

*Deceased

Aid to Recreation Program

On November 22, the Museum participated in an exhibit of material representing Chicago's outstanding facilities for education and recreation, under the auspices of the Chicago Recreation Commission. Mr. John R. Millar, Curator of the N. W. Harris Public School Extension of the Museum, was the representative of this institution.

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Chicago Natural History Museum

BULLETIN

Formerly Field Museum News

Vol. 16 MARCH-APRIL, 1945 Nos. 3-4

LECTURES AND FILMS ON SATURDAY AFTERNOONS THROUGH MARCH AND APRIL

The annual Spring Lecture Course for adults, consisting of nine lectures on subjects ranging over a vast geographic span—South America, Alaska, Scandinavia, the Far West of the United States, the Philippines, Australia, Mexico, and India—will be presented on Saturdays during March and April in the James Simpson Theatre.

One presentation, instead of being a lecture in the ordinary sense, will consist of a stage production, "Living India," dramatizing the life of a family in India, and will be presented April 28 by Ramkrishna and Manorama Modak.

All the lectures begin at 2:30 P.M., and with the exception of the Modaks' appearance, will be accompanied by natural color films. The March 31 program—"Pledge to Bataan"—is to be entirely a color film with sound effects, and accompanying commentary on the sound track in place of a lecturer in person.

Following are the dates, subjects, and lecturers for the entire series:

RUBBER QUEST

Shooting wild rapids of Coco River in Nicaragua in a native canoe.

A scene from the films accompanying the lecture "Good Neighbors and Strategic Materials," by Sullivan Richardson, which opens the Spring Course of Saturday afternoon programs, March 3, at 2:30 P.M.

The party traveled 500 miles on this river in search of wild rubber sources. Often boat had to be lowered on rope slings in worst rapids.

OTHER EVENTS

Besides the Saturday afternoon lectures for adults, various other special events are scheduled for March and April.

Programs for Children, Raymond Foundation, Saturday mornings—see page 7.

Daily Guide-Lecture Tours—see page 8.

Sunday afternoon Layman Lectures by Paul G. Dallwig (for adults)—see page 8.

Raymond Foundation-School Radio Council Broadcasts for children—see page 2.

March 3—GOOD NEIGHBORS AND STRATEGIC MATERIALS.

Sullivan C. Richardson.

Mr. Richardson who, with two associates, gained fame by making the first expedition by automobile along the entire route of the Pan American Highway from the Rio Grande to Cape Horn several years ago, and who has in previous seasons lectured at the Museum on this trip, now presents still more fruits of that notable journey. In the present film and lecture he tells the story of the materials, so desperately needed to bolster the United States' war and post-war effort, developed in the other Americas. This is the story of how products of our neighboring Americas save lives of our soldiers, fly with them through German skies, skim with them over dangerous Jap waters; how we get cinchona bark for life-saving quinine, loofa for the U. S. Navy, rubber, tin, quartz, mica, balsa, mahogany, rosella; products needed from Latin-American jungles, mountains and deserts to beat the Japs and Hitler, and win the peace.

March 10—ALASKA AND HER PEOPLE.

William L. Darden.

William L. Darden has been a resident of Alaska during a good part of the last twelve years. He recently returned from six months in Alaska, where he flew more than 11,000 miles taking color motion pictures for this lecture, which is entirely different from any he has given previously. The

beautiful color pictures in this new lecture have to do with the primitive Alaskan Eskimos, their life, economy, and homes.

March 17—SCANDINAVIA AND THE FAR NORTH.

Wirt W. Barnitz.

Mr. Barnitz gives a graphic description of the wonders and the famed scenery of Norway and Sweden; picturesque Dalecarlia; Lapland, quaint and strange; Visby—"Enchanted City," and the wonders of alluring Sweden; the fjords of Norway; glacier-clad mountain heights; lovely and mystical dals; salmon infested rivers; fjord-dwellers in brilliant costume. Denmark and Finland and the polar regions north of Scandinavia are included in this fascinating travelogue. Mr. Barnitz' films record a unique trip aboard a yacht-like canal boat from Gothenburg to Stockholm on winding rivers, canals and across several of Europe's largest lakes banked by the peaceful scenic countryside and romantic mediaeval castles. In this story of the North is included Mr. Barnitz' visit to the greatest vortex known, the Maelstrom and the Lofoden Islands and the Northern Lights.

March 24—HIGH COUNTRY.

Alfred M. Bailey.

Mr. Bailey, a former member of the Chicago Natural History Museum's zoological staff, and now director of the Colorado Museum of Natural History in Denver, is noted for the color films he makes which record phenomena in remote regions of America's Far West, as well as for his extensive knowledge of the natural history of our mountain country. With this lecture he will present the very latest films he has made, including some of the most unusual big game pictures he or anyone else has taken on this continent.

March 31—PLEDGE TO BATAAN.

(*Documentary motion pictures in colors, with commentary*).

The pledge to Bataan was, of course, a pledge to return. As in recent weeks General Douglas MacArthur has already returned with his troops to Manila, and may by the time this is in print, or at least by the time this lecture is presented, have taken Bataan, the pledge may already have been fulfilled, but this adds to rather than detracts from the timely interest of this remarkable film. The photographer is Captain David Griffin of the United States Marine Corps, who is also president of the the Marco Polo Society, and a true "citizen of the world." Of this film, the late Manuel Quezon, former President of the Philippines, said: "In 'Pledge to Bataan' you will see my land and my people as they were before the invasion. Here was truly the testing ground of the Four Freedoms for which the United Nations fight today—and for which they will continue to fight until the day of victory. I wish our enemies could see this picture. I think they might understand then, why Liberty is unconquerable!"

April 7—BROWN MEN AND RED SAND (Australia).

Charles P. Mountford.

Mr. Mountford's color films and lecture are the record of an expedition which he led to central Australia in 1940 to investigate the art and legends of the Australian aborigines for the University of South Australia. The journey, half on camels, covered nearly 4,000 miles, and the expedition was accompanied by native guides, and encumbered by some fifteen of the latter's relatives. The strange and definitely unique animal life of the huge island continent, different from that of any other part of the world, is dealt with, as well as the life of primitive native tribes. Scenic sequences include some of the most remarkable geological formations of Australia. Primitive cave paintings of prehistoric inhabitants are investigated.

April 14—BIRD MAGIC IN MEXICO.

Dr. Olin Sewall Pettingill, Jr.

This is the story of a Mexican wilderness, illustrated with the best of Dr. Pettingill's natural color motion pictures. Brilliantly plumaged birds are shown against a background of spectacular mountain scenery, a cypress-shaded and moss-draped river, and a dense forest with handsome flowering plants, gaily colored lizards, and showy butterflies. The action moves swiftly from one episode to another: Green paroquets feeding in a bamboo tree, an Alta Mira oriole building its huge, pendulous nest; a Muscovy duck courting and displaying; the amazing activities of leaf-cutting ants.

April 21—LIFE IN THE WEST.

Paul D. R. Ruthling.

"A panorama of the colorful Southwest" is the subject of Mr. Ruthling's lecture and natural color motion pictures of America's Pacific Coast and Southwest. The "stars" in his film are untrained wild animals and primitive aboriginal peoples. The plant life and geological features of the Southwest also come in for attention. A unique feature of the presentation is its musical background. Mr. Ruthling has spent years in the exploration of the tropical jungles and southwestern deserts, in charge of expeditions for the American Museum of Natural History, and other institutions.

April 28—LIVING INDIA—(A stage production depicting an Indian family at home).

Ramkrishna and Manorama Modak.

Mr. and Mrs. Modak, in a variety of costumes native to "Mother India," will illustrate for their audience the events in a typical day in the life of a typical medium-class family of India. They will demonstrate the intricacies of Indian dress, including the winding of a turban; the routine of the kitchen including the grinding of corn and cooking and serving of a meal; how water is carried in jars on the head from the well or stream to the house, and other details of daily living. Mr. Modak is a native of India, and Mrs. Modak, although born in Chicago, is the daughter of Indian parents.

No tickets are necessary for admission to these lectures. A section of the Theatre is reserved for Members of the Museum, each of whom is entitled to two reserved seats. Requests for these seats should be made in advance by telephone (WABash 9410) or in writing, and seats will be held in the Member's name until 2:30 o'clock.

NEW MUSEUM BROADCAST SERIES FOR SCHOOLS

Last semester's wartime series of radio programs, "Places and Peoples of the Far East," prepared and presented jointly by the Raymond Foundation of the Chicago Natural History Museum and the Radio Council of the Chicago Public Schools, aroused so much interest among pupils and teachers, that a new series has been arranged.

The new programs opened on February 14 with a program on the Philippine Islands. From that date on, programs have been scheduled on Wednesday mornings over the Board of Education's FM radio station, WBEZ at 11:15 A.M., with repeat performances the same afternoons at 1:30 P.M. over both station WIND and WBEZ.

The balance of the schedule is as follows:

Feb. 21—Philippine Islands (part 2).

Feb. 28—Burma.

March 7, 14, 21, 28—China (4 parts).

April 4, 11, 18 May 2—India (4 parts) (*no program April 25—schools' spring vacation*).

May 9—Java.

May 16—Thailand.

May 23—Newspaper Special, a "spot news" war region according to current events as they transpire at that time.

June 6—Summary of entire course.

As a tie-in, three special lecture-tours of correlated exhibits will be presented at the Museum as follows:

March 1—Philippines

March 29—China.

May 3—India.

For schoolteachers, a handbook has been prepared giving details of the programs.

Programs, scripts, handbook, and other details are the work of Mrs. Isabel E. Callvert of the Radio Council staff and Miss Miriam Wood, Chief Lecturer of the Museum's Raymond Foundation. Mr. Orr Goodson, Acting Director of the Museum, will speak on the first and last programs; the regular commentator presenting the programs will be Mr. John R. Millar, Curator of the N. W. Harris Public School Extension.

A FISH STORY—TRUE, AND STRANGER THAN ANY FICTION

By MARION GREY
ASSOCIATE, DIVISION OF FISHES

There has recently been placed on exhibition in the Hall of Fishes (Hall O) a model of *Latimeria chalumnae*, a fish with a remarkable history.

In December, 1938, fishermen in a trawler off the coast of South Africa found, in addition to their usual catch a strange bright blue fish, five feet long, thrashing about in their nets. The trawl-net had been hauled from forty fathoms (240 feet) about three miles offshore, near East London and off the mouth of the Chalumna River.

The fish was entirely unlike any they had ever seen before. Its body was covered with heavy bony scales. Most of the fins were fleshy and limb-like, and the creature was equipped with what seemed like two tails, one large and fleshy, the other a small structure attached to the end of the larger one. Because the ship's captain recognized the creature as something unusual, the mounted skin found its way to Dr. J. L. B. Smith of Rhodes University at Grahamstown, who described it for science as *Latimeria chalumnae*.

LIVING EXAMPLE OF A 350-MILLION YEAR OLD TYPE

Latimeria chalumnae, a relic of past ages, discovered in 1938. Unlike anything known in the modern fish world before, it has a double tail corresponding to that of fossil relatives, and large fleshy fins which in the older species foreshadowed the development of limbs for locomotion on land.

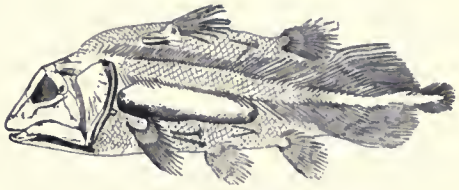
The discovery of *Latimeria* gives hope to the scientific world that the ocean deeps may shelter other relicts driven from their former habitats by modern animals that are better fitted to exist under modern living conditions. Most types of animals cannot persist through the ages as *Latimeria* has done. The more perfectly a species evolves to suit its environment, the less chance it has of surviving a change—either sudden or gradual—in that environment.

A more generalized species can adapt itself to a new habitat, as this animal's forebears obviously have done, or can continue evolution to meet new conditions. Other species, such as some of the flightless birds that have become extinct in recent times, can neither hold their own against an invasion by stronger or more agile competitors, nor can they retreat to a restricted and perhaps safer ecological niche, as *Latimeria* and the lungfishes have been able to do.

The nearest known relative of *Latimeria* lived in the Cretaceous period, more than 65,000,000 years ago and the group to which it belongs, the Crossopterygia ("fringe-finned ganoids") dates even farther back—to the Devonian period in fact, about 350,000,000 years ago. This was before the invasion of the land by the amphibians, and it was forms not unlike the crossopterygian fishes that began the invasion by the backboned animals. Amphibians, reptiles, mammals, and finally man himself were in turn developed out of those first elementary land vertebrates.

Latimeria has come down through the ages so little changed that it can unquestionably be placed in the system of classification close to the extinct family Coelacanthidae. Reconstructions of fossil coelacanths made by paleontologists bear an amazing likeness to the living specimens, and it is a remarkable circumstance that a remnant of such an old group should have undergone so little evolutionary change through so many millions of years.

The discovery of living lungfishes in 1871 was an important scientific event, as these creatures had also been thought until that time to be extinct. They had long been known from well preserved and abundant fossils. The lungfishes are relatives of the



LATIMERIA'S ANCIENT RELATIVE

Prehistoric fish called Undina penicillata by paleontologists. It lived about 150,000,000 years ago, and typifies others going back as far as 350,000,000 years. The similarity of its fins and double tail to those of the modern Latimeria is readily apparent.

fringe-finned ganoids, and the discovery of *Latimeria* forms a striking parallel to the history of the knowledge of these fishes.

Relicts (often called "living fossils") of groups of animals formerly abundant and now reduced to a small remnant are by no means uncommon, although usually the modern representatives are far more changed by time than *Latimeria* has been. Land forms have in many cases retreated to the southern continents, and the marine relicts mostly to the tropical or to the deep seas.

MUCH SEA LIFE UNKNOWN

Modern fishing methods are by no means adequate to catch all of the large swift-moving animals that might be found beneath the surface, nor are they efficient enough to secure a fully representative collection of the sea's inhabitants. The fact that trawls and other devices used to explore the ocean have brought up very few large animals does not mean, as has sometimes been supposed, that there are no more to be found.

William Beebe, who descended as far as half a mile beneath the surface of the sea in the bathysphere, disproved the supposition that the unlighted depths are but scantily populated. He found that the proportion of living things seen was infinitely greater than had been assumed when judging from the results of daily catches.

MODEL HERE UNIQUE

The model of *Latimeria chalumnae* is the work of Mr. Leon L. Pray. His thorough knowledge of fish taxidermy combined with the excellent detailed photographs and descriptions by Mr. J. L. B. Smith have enabled Mr. Pray to produce a model unique among museum exhibits.

The new model fits very naturally into a panel exhibiting other "living fossils" among fishes. Its nearest relatives, shown with it, are the lungfishes, which have fleshy-lobed fins, and which are likewise relicts from the Paleozoic Age.

The most astonishing of all such relict forms, perhaps, are the lampreys, whose relations to the earliest fossil fish-like creatures have only recently been established. More familiar to us in North America are the gars and sturgeons, whose living representatives are likewise relics of the life of past geological ages.

FOOD PLANT CONTRIBUTIONS TO THE MODERN DIETARY FROM BOTH OLD AND NEW WORLDS

By B. E. DAHLGREN
CHIEF CURATOR, DEPARTMENT OF BOTANY

Some years ago the Department of Botany gathered into one exhibition case a representation of the principal vegetables and fruits of the Western Hemisphere. In the course of the four centuries and a half which have elapsed since the discovery of America almost all of these plant foods have attained world-wide distribution and in many places have become so common that their original American derivation has been forgotten. In parts of Europe, maize or Indian corn is thus popularly attributed to Turkey and called Turkish corn, just as in the United States the Chilean potato is called Irish or, in eastern South America, English.

PLANT FOODS OF THE OLD WORLD
(Hall 25)

Aside from a few small fruits such as the wild strawberry, small blueberries and the like, which in their wild state have a circumpolar distribution, the food plants native to the Western Hemisphere are quite distinct from those of the several continents of the Old World.

On his first contact with the New World, Columbus found the inhabitants of Haiti using vegetable foods that were strange to him. Some of these he carried back with him to Spain. The early explorers who followed in his tracks discovered many other food plants in cultivation and use among the New World natives. This was the case especially among the Aztecs of Mexico and the Incas of Peru, who, as we now know, inhabited areas that have been important centers of origin and dispersal for the New World plants.

USE OF SOME DELAYED

The European settlers both in North and South America quickly learned to use many of the vegetable foods of the Indians, including corn and beans that were commonly grown together, also pumpkin and squash, and, in South America and the West Indies, cassava. Some American food plants, such as the potato, failed to come into general use among the new population in the continent of their origin until after they had been carried to Europe and developed in cultivation and popularity there. Largely because of climatic requirements, some American food plants, such as the arracacha of western South America, are still confined chiefly to their original center. Others, such as the chayote and avocado, have only very recently found a somewhat general but still limited acceptance outside of their natural range.

The Old World food plants are more numerous than those of the New. They have not only originated over a much larger and more diversified area but they have unquestionably been subjected to cultivation and selection for a much longer time. They include all the small grains, which have been "the staff of life" of mankind for thousands of years—wheat, rye, barley, oats and rice, millets and sorghum—as well as all the numerous vegetables and fruits found on the continents of Europe, Asia, and Africa, long before the discovery of the Americas.

The use and cultivation of most of these antedate all written records and carved inscriptions by so many thousand years that their origins can now be discovered, if at all, only through botanical investigation in the various regions where their nearest relatives still exist in the wild state.

FIVE DISTINCT AREAS

Recent explorations by Russian botanists in search of plants for their breeding experiments indicate the existence of five distinct areas of probable origin and earliest cultivation of the principal crop plants of the Eastern Hemisphere. The location of these areas is shown on the map which forms the last of the murals in the Museum's Hall of Food Plants (Hall 25):

(1). *Southwestern Asia from Transcaucasus to the Hindu Kush Mountains and adjoining northwest India*—soft wheat, rye, chick-peas, horsebeans, turnips, carrots, most common fruit trees.

(2). *Southeastern Asia, especially the mountains of eastern and central China*—soybeans, millet, naked oats, hull-less barley, jujube, apricot.

(3). *Northwestern Indo-China and Burma*—rice, citrus fruits.

(4). *Mediterranean region and mountainous parts of northern Africa*—olive, fig, large-grained peas, lentils, beet-root.

(5). *The highlands of Abyssinia*—barley, durum wheats, ragi and teff, millets, sorghum.

LARGELY MOUNTAINOUS

All of these areas are largely mountain and foothill regions, and the earliest cultivation of food plants appears to have taken place in such terrain rather than in river valleys or on the plains as was formerly assumed on the strength of historical and linguistic studies.

To the large number of food plants derived from the continental area of the Eastern and Western hemispheres there should be added a relative few that have originated in less important regions. Malaysia and Polynesia have thus contributed various edible fruits and tubers; Central and South Africa oka, types of sorghum and melons; Australia and New Zealand, on the other hand have contributed very little.

PLANT FOODS OF THE NEW WORLD
(Hall 25)

To the great benefit of the inhabitants of most parts of the world, the food plants of both hemispheres are now cultivated wherever climatic conditions permit, while thanks to the impetus of genetics, an intensive search constantly goes on for new and improved varieties.

British Museologists Study Here for Post-War Project

In preparation for post-war rehabilitation of museums in Great Britain, Sir John Forsdyke, Director of the British Museum in London, and Dr. Henry Thomas, Keeper of Printed Books of that institution, visited this Museum and consulted with various members of its administrative and scientific staff for several days beginning January 25. They are making a tour of the United States and Canada for similar consultations in other leading museums.

BRYAN PATTERSON MISSING ON WESTERN FRONT

Pfc. Bryan Patterson (on leave from his post as Curator of Paleontology at the Museum since October, 1943 for service with the Army) has been reported missing in action on the Western Front, in an official telegram received from the War Department by Mrs. Patterson.

BRYAN PATTERSON

Several weeks before the receipt of this news, Mr. Patterson had been reported wounded by shrapnel, and temporarily hospitalized, but the reports indicated those injuries were slight in nature, thus accounting for his apparent early return to active duty.

Since so large a proportion of those listed as "missing in action" turn out to be prisoners of war and eventually are returned, Mr. Patterson's family and Museum associates have strong hopes of hearing good news about him, especially since the unit to which he was attached was apparently on the advance at the time he was reported missing.

Mr. Patterson entered the Army in October, 1943. He has been a member of the Museum staff since 1926.

U. S. FLIERS IN NEW GUINEA DISCOVER A SHANGRI-LA

By DONALD COLLIER
CURATOR, SOUTH AMERICAN ETHNOLOGY AND ARCHAEOLOGY

Recently a sealed, hidden valley populated by an estimated 50,000 natives who had never seen or been seen by white men was discovered in the unexplored heart of the Oranje Mountains in central Dutch New Guinea, 150 miles from Hollandia. The discovery of this real-life Shangri-La was made by the crew of a United States Army air transport on a mission of exploration in search of new strategically advantageous flying routes across New Guinea.

The island of New Guinea, which is more than 1,500 miles long and second in area only to Greenland, contains one of the few extensive unexplored areas remaining in the world. The least known part of the island is its mountainous backbone that rises to eternally snow-covered peaks more than 16,000 feet high.

Because of the dense and nearly impenetrable jungle that lies between these mountains and the coasts to the north and south, this interior region has been reached at only a few places by government exploring parties and missionaries. In 1938 the Archbold Expedition flew an amphibian plane to Lake Habbema at an altitude of 11,000 feet, and discovered 60,000 unknown natives living in a near-by mountain valley.

The following account of the new discovery by the Army Air Force is from a report by George Lait, International News Service correspondent, published in a New Guinea news sheet of the Army.

VANISHING RIVER

"The C-47 transport flew into the mountain valley and for an hour skimmed back and forth less than 100 feet above the valley's floor. For the first time in history, this twenty-by-five mile cleft in the towering mountains was photographed.

"Completely encompassed by sheer, jagged mountains, some of which are more than 12,000 feet high and some perpetually snow-covered, the sealed valley runs for about twenty miles almost due north and south. Through the center of the five-mile-wide floor of the valley which is 5,500 feet above sea level, winds the Baliem River, which enters the sealed valley at its southern extremity in a 2,000-foot fall down an almost perpendicular cliff of bare rock. At the northern extremity of the valley, the river vanishes into a huge hole in a mountain, a natural grotto, the arch of which is at least 300 feet above the surface of the stream. It was impossible to ascertain from the air whether the river again returned to the surface.

"The entire valley floor, as well as the sloping hills which edge the towering peaks, has been placed in an extensive and efficient state of cultivation. The whole level section for the full twenty-mile length is under irrigation, with seemingly endless series and rows of ditches to carry water from the swift-flowing Baliem to farming plots as much as three miles from the river bank.

CHECKERBOARD FIELDS

"The fields themselves are laid out in checkerboard squares, as perfectly formed as the fields of Iowa would appear from the air, and varying in size from tiny 100 × 100-foot plots to vast projects encompassing as much as 50 to 60 acres.

"On the hillsides, where irrigation is impossible, these primitive farmers likewise have utilized every available inch of arable land. Rocks have been cleared away and piled in neat fence-like rows, completely bordering the growing crops and giving the appearance of a ruggedly hilly New England farming section.

"Scattered throughout the length and breadth of the valley are more than 100 native villages, some covering fifteen acres, and each surrounded by either a fence of woven reeds and twigs, or by a perfectly straight stone fence about breast high. The houses have circular thatched roofs.

CROPS IDENTIFIED FROM AIR

"Skimming less than 100 feet over the valley floor, one was able to identify among the native crops banana trees, a water plant (swamp taro), ... extensive patches of the native sweet potato or yam, and a waist-high plant closely resembling tobacco.

"Of animals, only a few dogs and pigs were seen. The pigs, staple meat food throughout New Guinea and religiously revered by most natives of the island, appeared exceptionally large and well kept, and of two varieties—an all-black or dark brown species, and a black and white variety, the latter growing to immense size.

"When the plane first roared over the valley, crowds of natives ran from their houses and vanished into the standing crops or clumps of trees. But after flying down the valley several times, their child-like curiosity seemed to overcome their fear of the motors—they cautiously emerged to watch the soaring plane."

This bird's-eye account suggests that these newly discovered people are Papuans similar in their customs to other groups of natives previously encountered in the interior of New Guinea. In their methods of agriculture, including the irrigation systems for growing swamp or wet taro, and in the kinds of crops cultivated, the form and arrangement of their houses, and the possession of pigs and dogs, these people share in the already known culture of the interior Papuans.

IMPORTANT TO SCIENCE

The discovery of such a group is anthropologically important, however, because it offers the opportunity to study a people uninfluenced by whites or even by their lowland neighbors and possibly to discover new variations in social organization or religion. The plane crew was under the impression that these people had lighter skins than those of any other natives they had seen in New Guinea. This would appear to be a difficult question to judge from the air, and should be left open until a government or missionary party reaches the group after the war.

It is interesting to note that although tobacco, an American plant, probably did not reach New Guinea until the 16th Century, the native tribes of the interior, who have never seen a white man, have been found not only growing and smoking tobacco, but believing their ancestors had done so from time immemorial.

There are no less than 79 different kinds of birds of paradise in New Guinea and the surrounding islands. Thirteen of these may be seen in Hall 21.

The giant frog, well-named *Rana goliath*, found only in a limited jungle area in West Africa, is represented in Hall 18 by a life-size model. It is much admired by would-be frog farmers, who frequently inquire as to the possibility of importing it to the United States for breeding purposes.

Chicago Natural History Museum

FOUNDED BY MARSHALL FIELD, 1893

Roosevelt Road and Field Drive, Chicago

TELEPHONE: WABASH 9410

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THE BULLETIN

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Members are requested to inform the Museum promptly of changes of address.

PROFESSOR SAMUEL J. RECORD, MUSEUM ASSOCIATE, IS DEAD

The Museum regretfully reports the death, on February 3, of a highly esteemed member of its staff, Dr. Samuel J. Record, Professor of Forest Products and Dean of the School of Forestry of Yale University.

For the past twenty years Professor Record has served as Research Associate in the Museum's Department of Botany and consultant in matters pertaining to woods and wood anatomy. His close relations with the Museum date from 1923, when he called to urge the assemblage of collections of tropical wood samples accompanied by authentic herbarium specimens for determination. He was promptly offered for study exactly such a collection, a part of which had just arrived, and the rest of which was in process of being assembled by a Museum botanical collector in British Guiana. He pronounced it the first properly made extensive collection of foreign woods that had ever come to his notice, and undertook the study of the woods with the aid of one of his students.

When it was decided to reduce the Museum's exhibits of North American woods to a single hall, he was asked to aid in the selection and to prepare the descriptive labels, which were subsequently published by the Museum in the form of a handbook. Through his wide contacts with foresters and firms engaged in the lumber industry he solicited and obtained for the Museum many important additions to the exhibits of domestic and foreign woods.

In return, members of the staff became contributors to his Yale University wood collection and to his technical periodical, *Tropical Woods*.

Professor Record was one of the founders of the International Association of Wood Anatomists and author of *Timbers of the New World*, a summary of his wide knowledge of American forest trees and their woods, published last year. —B.E.D.

Staff Notes

Mr. Loren P. Woods (Assistant Curator of Fishes, on leave for service in the Navy) has been promoted from the rank of Ensign to Lieutenant (j.g.). Lieutenant Woods recently visited his associates at the Museum during a furlough.

Mr. George Jahrand, Museum guard on leave for service as a chief machinist in the U. S. Navy, died in service January 5. His is the second star on the Museum service flag to be changed to gold.

Mr. Henry Horback, (Assistant in Geology, on leave for service with the U. S. Army) has been promoted to the rank of staff sergeant.

Mr. Robert Yule, Assistant in Archaeology, Department of Anthropology since 1932, has had to retire from the service of the Museum because of failing eyesight. He left on February 10 for special instructions offered to the blind and near-blind by the Barnes School, at Henniker, New Hampshire. Fellow employes at the Museum presented him with a repeater watch equipped with chimes to tell the time without visual reference.

Dr. Francis Drouet, Curator of Cryptogamic Botany, has been elected Research Associate in Botany on the faculty of Northwestern University, in recognition of his scientific attainments, and his co-operation with the university in various projects. This election honors both Dr. Drouet and the Museum.

Dr. Everett C. Olson, of the Walker Museum of Paleontology at the University of Chicago, has been appointed to the Museum staff as Associate, Division of Invertebrate Paleontology.

Mr. Harry Changnon, who has been working in the Department of Geology for five years, has been promoted to the position of Assistant in Geology.

Mr. Fred Barkley, of the staff of the University of Texas, has taken a leave of absence from that institution for temporary employment at this Museum. He will be engaged in research projects in the Museum herbarium.

THE MUSEUM HONOR ROLL

Now in the Nation's Service

Army

GEORGE A. RICHARDSON, Trustee—Lt. Col.
CLIFFORD C. GREGG, Director—Colonel, G.S.C.
DR. JOHN RINALDO, Associate, Southwestern Archaeol.—Staff Sgt.
DR. SHARAT K. ROY, Curator, Geol.—Capt.
D. DWIGHT DAVIS, Curator, Anat. and Osteol.—Corp.
BRYAN PATTERSON, Curator, Paleontology—Pfc. *(Reported missing in action since Jan. 19, 1945)*
EMMET R. BLAKE, Asst. Curator, Birds—Special Agent, War Dept.
RUPERT L. WENZEL, Asst. Curator, Insects—Capt.
HENRY S. DYBAS, Assistant, Insects—T/5.
WILLIAM BEECHER, Temp. Asst., Zool.—Pfc.
HENRY HORBACK, Asst., Geol.—S. Sgt.
JAMES C. MCINTYRE, Guard—2nd Lt.
RAYMOND J. CONNORS, Guard—Pvt.
FRANK J. DUTKOVIC, Janitor—Pvt.

Navy

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JAMES H. QUINN, Chief Preparator, Paleontol.—Metalsmith 2C
PATRICK T. MCENERY, Guard—Master Gunner
CLYDE JAMES NASH, Guard—Master Gunner
NICHOLAS REPAR, Printer—Aviation Machinist's Mate 1C.
MORRIS JOHNSON, Carpenter—Carpenter's Mate 1C.
HERBERT NELSON, Painter—Painter 1C.
ELIZABETH BEST, Guide-Lecturer—Lieut. (j.g.), WAVES
MARIE B. PABST, Guide-Lecturer—Lieut. (j.g.), WAVES

Marine Corps

MELVIN A. TRAYLOR, JR. Associate, Birds—Capt.

Coast Guard

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JOHN MCGINNIS, Guard—Ch. Boatswain's Mate

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RUDYERD BOULTON, Curator, Birds—Staff of Office of Strategic Services
BRYANT MATHER, Asst. Curator, Mineralogy—Civilian Worker, Corps of Engineers, U.S. Army
LLEWELYN WILLIAMS, Curator of Economic Botany—on special service for U.S. Government
DR. JULIAN A. STEYERMARK, Asst. Curator, Herbarium—field work for Board of Economic Warfare
DR. C. MARTIN WILBUR, Curator, Chinese Archaeol. and Ethnol.—Staff of Office of Strategic Services

Died in Service:

THEODORE ROOSEVELT, Trustee—Brig. Gen., U.S.A.
GEORGE JAHRAND, Guard—Ch. Machinist, U.S.N.

Served and Honorably Discharged:

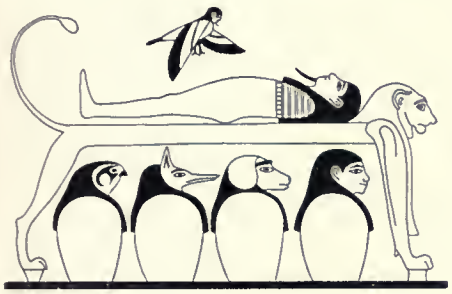
JOHN SYCKOWSKI, Guard—Ch. Commissary Stewd., U.S. Navy

A LEAFLET ON MUMMIES PUBLISHED BY MUSEUM

Of all the exhibits at the Chicago Natural History Museum, through all the years since it was founded in 1893 (as Field Museum), the most fascinating to the public—adults and children alike—have been the ancient Egyptian mummies.

This statement is agreed to not only by members of the Department of Anthropology in whose charge the mummies fall, but by the other Departments, Zoology, Botany and Geology, each of which has striven to present the most interesting subjects possible in its own fields.

Further, it is agreed to not only by the curators and others on the scientific staff,



MUMMY'S SOUL RETURNS

Illustration in Mr. Martin's book, after a carving of the 4th Century B.C. The soul is a human-headed bird. Under the leonine couch are the four traditional Canopic jars, for the viscera.

but by guards and door attendants who endlessly are called upon to answer the questions of a million and a quarter visitors a year, and who report that the most frequently asked question is: "Where are the mummies?" and the next most frequently asked are queries about how old the mummies are, where they came from, how the Museum acquired them, how they were preserved, and so on.

At long last, the Museum Press has published an illustrated leaflet which anticipates the usual questions about mummies, and answers them with all the essential information, in layman's language and with drawings, photographs, and color plate.

The text, and the drawings, are both the work of Mr. Richard A. Martin, the Museum's Curator of Near Eastern Archaeology. The leaflet, in striking pastel-colored covers of Egyptian design, is offered at approximately cost of production*.

It contains 18 pages of text, a color plate of one of the Museum's most spectacular mummies (a woman named Tinto who lived in the 9th Century), 11 of Mr. Martin's drawings illustrating phases of Egyptian life as well as mummification, based on originals in ancient painting and sculpture; and half-tone plates of the interior of the famous tomb of Tutankhamun, various other tombs, sarcophagi, mummies, animal mummies, and X-rays of mummies; and a cross section diagram of the interior of the Great Pyramid.

In his description of the various steps involved in mummification, Mr. Martin makes the interesting comment that "the preservation of the body itself was accomplished in a manner somewhat similar to that of drying fish," whereupon he supplies the details. He also gives an outline of the Egyptian belief in an invisible corporeal "twin" known as "ka," supposed to have been born with each person.

*25 cents.

SPRING MOVIES FOR CHILDREN —RAYMOND FOUNDATION

Nine free programs of motion pictures for children will be presented in the annual spring series of the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures on Saturday mornings during March and April. These programs, to which children from all parts of Chicago and suburbs are invited, will be presented twice each Saturday, at 10 A.M. and at 11, in the James Simpson Theatre of the Museum.

On two of the programs—April 7 and April 21—there will be "in person" appearances of men connected with the films. Mr. Leon Smith, trainer of chimpanzees at the St. Louis Zoo, together with Suki, a Great Dane dog which was raised with the chimps, will appear, with "Chimpanzee Circus" on the first of these dates. "Jaunt for Juniors" on April 21 will be accompanied by a lecture presented by Mr. Bert Harwell, of the National Audubon Society, who will interpret the natural color motion pictures of birds, animals and flowers, and will give some of the bird calls.

Following is the schedule:

March 3—THE AMAZON AWAKENS.

A Walt Disney picture interpreting the Amazon region in South America.

And a cartoon.

March 10—ITCHY SCRATCHY.

Story of a pet bear in the north woods.

Also a film on animal babies and a cartoon.

March 17—SOUTH OF THE BORDER WITH WALT DISNEY.

A color pictorial record of Walt Disney in South America as the picture "Saludos Amigos" was being made.

And a cartoon.

March 24—HERE IS CHINA.

A recent picture of life in China. Picture shows life just before the Japanese invasion and the migration of the Chinese people westward after the invasion. It shows how the Chinese people have adapted themselves to a new way of life.

March 31—ADVENTURES OF CHICO.

The story of a little Mexican boy. (Repeated by request).

April 7—CHIMPANZEE CIRCUS.

A color motion picture accompanied in person by Mr. Leon Smith, trainer of the chimps in the St. Louis Zoo and Suki, the Great Dane dog raised with the chimps. Suki will perform for the children.

April 14—WEDDING OF PALO.

Picture of Eskimo life in Greenland played by an all-native cast.

April 21—JAUNT FOR JUNIORS.

Mr. Bert Harwell of the Audubon Society, will interpret the color motion pictures of birds, animals and flowers, and give some of the bird calls.

April 28—AN ALL-CARTOON PROGRAM.

"THE DESCRIPTION OF EGYPT" ADDED TO LIBRARY

The accession of the great French work *Description de l'Egypte*, comprising ten folio volumes of text and an atlas of thirteen large folio volumes, forms one of the most notable recent additions to the Museum Library.

When the young First Republic sent an expeditionary force to Egypt under Napoleon, a by-product of scientific exploration was envisaged, and a corps of scientists was included. Their aims seem to have been on the level of pure science rather than on the "geopolitical" exploitation of the country. As a result, their work affords source material to the historian, archaeologist, geologist, botanist, and zoologist.

The publication of this great work in a uniform style, with the reports of various specialists in so many fields of knowledge, to a large extent set the style of the reports of the great exploratory expeditions of the 19th century. The planned survey of a region also set a most significant example. One may think of the remarkable and perhaps conscious parallel of the *Mission Scientifique au Mexique*, which accompanied the seizure of Mexico under the instigation of another Napoleon. —K. P. S.

New Technical Publications from the Museum Press

The following technical publications have been issued by the Chicago Natural History Museum Press since the appearance of the last BULLETIN:

Zoological Series, Vol. 29, No. 15. *New North American Fleas.* By Robert Traub. December 20, 1944. 10 pages. $ .10.

Anthropological Series, Vol. 33, No. 3. *The Florida Seminole Camp.* By Alexander Spoehr. December 25, 1944. 5 plates and 8 text figures. $ .50.

LAYMAN LECTURES ON SUNDAYS TO BE RESUMED IN MARCH

Mr. Paul G. Dallwig, the Museum's "Layman Lecturer," widely-known for his interpretations of scientific subjects in unscientific language, presented on Sunday afternoons at the Museum since 1937, has been on the road to lecture before audiences on the Pacific Coast during February.

Mr. Dallwig will now resume Museum lectures with "Who's Who in the Jungle Zoo" on March 4, and will lecture here *every Sunday* from that date through May 27 inclusive. On Sundays in April his subject will be "Romance of Diamonds from Mine to Man"; in May, "The Romance of Wood."

The March lecture includes interesting observed incidents in the life of wild animals; a study of their intelligence and behavior: stories of animals in relation to man; the dramatization of "A Day in Africa," and other features.

The April lecture will tell the story of diamonds from their original "find" through the various stages of mining, sorting, cutting, polishing, pricing, and marketing; and dramatize the finding and mining of diamonds in South Africa.

Lectures begin at 3 P.M. (*an hour later than in previous seasons*) in the lecture hall.

The heavy demand by the public, and the necessary limitation of audiences to the accommodations, make it essential to require advance reservations. Lectures are restricted to adults, and children cannot be admitted. *Persons desiring to attend are advised to apply several weeks in advance by mail or telephone* (WABash 9410).

LECTURE TOURS ON WEEKDAYS, MARCH AND APRIL

Conducted tours of exhibits, under the guidance of staff lecturers, are made every afternoon at 2 o'clock, except Sundays and certain holidays. On Mondays, Tuesdays, Thursdays, and Saturdays, general tours are given, covering all departments. Special subjects are offered on Wednesdays and Fridays; a schedule of these follows:

March

Fri., Mar. 2—The Philippine Islands (Mrs. Roberta Cramer).

Wed., Mar. 7—Animal Antics—Interesting Animal Habits (Loraine Lloyd).

Fri., Mar. 9—Trailing Animals from the Past—Fossils (Velma Whipple).

Wed., Mar. 14—Roads to the Orient—Vanishing Point of East and West (Emma Neve).

Fri., Mar. 16—Prehistoric Invaders of Europe (Mrs. Roberta Cramer).

Wed., Mar. 21—Spring in the Woodlands—The Earliest Flowers, Leaves, Birds, and Reptiles (Miriam Wood).

Fri., Mar. 23—For Amateur Rock Collectors (Velma Whipple).

Wed., Mar. 28—A Spring Invasion—Bird Migrations, Habits, and Characteristics (Loraine Lloyd).

Fri., Mar. 30—Animals As Supernatural Beings—Primitive Beliefs in the Powers of Animals (Emma Neve).

April

Wed., Apr. 4—April Fool in Nature—How Animals Can Fool Us (Loraine Lloyd).

Fri., Apr. 6—Rain—The Importance of Rain to Various Civilizations (Mrs. Roberta Cramer).

Wed., Apr. 11—A Frog's Eye View of Spring—Marsh and Pond Life (Velma Whipple).

Fri., Apr. 13—Forecasting Success—Primitive Planning (Emma Neve).

Wed., Apr. 18—Spring in the Tree Tops—Trees in Bloom (Miriam Wood).

Fri., Apr. 20—Birds on the Home-front—Getting Acquainted with Birds (Loraine Lloyd).

Wed., Apr. 25—Sky Lights—Moon and Meteorites (Velma Whipple).

Fri., Apr. 27—Keeper of the Smokes—How Different Peoples Have Used Fire (Mrs. Roberta Cramer).

Persons wishing to participate should apply at North Entrance. Tours are free. By pre-arrangement at least a week in advance, special tours are available to groups of ten or more persons.

GIFTS TO THE MUSEUM

Following is a list of some of the principal gifts received during the last two months:

Department of Anthropology:

From: Mrs. Joseph K. Frank, Chicago—an Egyptian scarab of steatite.

Department of Botany:

From: Pvt. Standley B. Lummis, U. S. Army—61 herbarium specimens, Adak Island, Alaska; Pvt. Rodger Mitchell, U. S. Army— 19 herbarium specimens, Georgia; Robert Runyon, Brownsville, Tex.—167 specimens of algae, Texas; Ben Osborn, San Angelo, Tex.—18 herbarium specimens, chiefly Oklahoma; Dr. Earl E. Sherff, Chicago—75 herbarium specimens, Hawaii, and 47 negatives of plant specimens; Dr. Walter Kiener, Lincoln, Neb.—90 specimens of algae, Nebraska; S/Sgt. H. J. Rogers, U. S. Army—34 specimens of algae, New Guinea.

Department of Geology:

From: James Portis, Chicago—a step-cut citrine weighing 35 carats; Alfred A. Look, Grand Junction, Colo.—19 specimens of crystals, Colorado.

Department of Zoology:

From: Chicago Zoological Society, Brookfield, Ill.—12 birds and 6 mammals; Lincoln Park Zoo, Chicago—10 birds, a juvenile zebu, and a boa; Col. Clifford C. Gregg, Washington, D.C.—11 insects, Virginia and Arizona; Boardman Conover, Chicago—6 birds, Iceland and Peru, and 7 pigeons and a sand-grouse from varied localities; Pfc. William J. Beecher, U. S. Army—179 birds and 20 mammals, South Pacific, including Solomon Islands; Alex K. Wyatt, Chicago—26 insects, Illinois, Indiana, Florida; Cpl. Eugene Ray, U. S. Army—111 insects and their close allies, California; Dr. T. S. Jones, St. Augustine, Trinidad, B. W. I.—4 bats, Trinidad; Miss Ann Zay, Oak Park, Ill.—2 ear bones of a large whale, Alaska; W. H. Tripp, New Bedford, Mass.—a jagging wheel and 2 bodkins; Frank C. Wonder, Chicago—2 scrimshaws; Lieut. (j.g.) Loren P. Woods, U.S.N.R.—19 fishes, Pacific Ocean.

Library:

From: C. J. Cummings, Oakland, Calif.; Pierre Dansereau, Montreal, Canada; Professor J. M. Gillette, Grand Forks, N. D.; Paul Honigsheim, East Lansing, Mich.; Investor's Syndicate, Minneapolis, Minn.; Miss Lila Lisconbee, Salt Lake City, Utah; Miller Laboratories, North Bergen, N. J.; National Research Council, Washington, D. C.; J. J. and M. W. O'Brien, South Bend, Ind.; Howard S. Reed, Berkeley, Calif.; Nierendorf Gallery and Fortune, New York City; Rhode Island Industrial Commission, Providence; Harold B. Wood, Harrisburg, Pa.; and Boardman Conover, Dr. B. E. Dahlgren, William J. Gerhard, Dr. W. H. Osgood, Paul C. Standley, Henry Miller, Steel Sales Corporation, and Westinghouse Electric Supply Company, all of Chicago.

NEW MEMBERS

The following persons became Members of the Museum during the period from December 18 to February 10:

Associate Members

R. M. Beckler, Dr. Clinton A. Elliott, J. W. Gimbel, Jr., Mrs. L. L. Schaffner, Miss Olive M. Shepherd, Benjamin F. Wupper.

Annual Members

Beatrice Barbee, Raymond Bassett, J. Lyman Bingham, Mrs. Samuel B. Blanksten, Robert N. Burton, Luther E. Crist, H. J. DeCosta, John J. Faissler, B. L. Finn, James K. Geraghty, Joseph L. Gill, Ramon B. Girvin, Harry M. Gustafson, Mellor Hargreaves, LeRoy K. Hitchings, Miss K. Eileen Hite, Dr. Walter C. Hoag, A. C. Knutson, M. T. Laser, Mrs. Arthur A. Levisohn, Miss Esther L. Marcussen, Mrs. Della Mower, Dr. George W. Moxon, Burton B. Moyer, Maurice B. Pendleton, Morton H. Petrie, Miss Sylvia M. Picha, Fred S. Roller, J. M. Sammet, Arthur Robert Seass, Bruce L. Simpson, Fred B. Straka, Jacob A. Teach, Roy V. Thorton, John T. Toomey, Miss Frances Tyrrell, C. Stanley Zalewski.

Visiting Hours Change March 1

Beginning March 1, spring visiting hours, 9 A.M. to 5 P.M., will replace the winter schedule of 9 to 4. The new hours will continue in effect until April 30, after which the Museum will be open from 9 A.M. to 6 P.M. until September 3 (Labor Day).

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SCIENCE AND ART APPLIED TO A "NOAH'S ARK" MINIATURE COLLECTION

From the child who delights to play with miniatures of grown-ups' things, to the serious architect or engineer who envisions great works from small scale models, the utility of objects portrayed in reduced size has seldom been questioned by anyone. Miniatures of all kinds, quite apart from their possible artistic merit, appeal to our imagination and ingrained whimsicality.

This mood is the source of much of the amusement and pleasure derived from stories like those of Lewis Carroll, or even from the satirical tale of Gulliver's "Voyage to Lilliput," and is the first reaction to the collection of "Animals in Miniature" which was placed on exhibition in Carl E. Akeley Memorial Hall (Hall 22) April 4, to remain until June 4. Arrangements to bring them here were made by Mr. Orr Goodson, Acting Director, when the models aroused great public interest during a similar temporary exhibit at the American Museum of Natural History, New York, earlier in the year. Widely circulated national magazines and newspaper magazine supplements have published feature articles on the unique collection.

"Come listen, my men, while I tell you again
The five unmistakable marks
By which you may know, wheresoever you go,
The warranted genuine Snarks.

* * * *

" . . . . It next will be right
To describe each particular batch:
Distinguishing those that have feathers, and bite,
From those that have whiskers, and scratch."

From *The Hunting of the Snark*, by Lewis Carroll.

AFRICAN BLACK BUCK PURSUED BY A CHEETAH

One of the miniatures by Louis Paul Jonas, on special exhibition in Carl Akeley Memorial Hall (Hall 22)

The models are the work of Louis Paul Jonas, well-known taxidermist and sculptor, who was formerly a member of the staff of the American Museum. In recent years he has been a free-lance artist with his own studio engaged in the preparation of exhibits for museums and other organizations in various parts of the country.

Ever since sculptured manikins replaced excelsior and tow "stuffing" in the modern taxidermist's bag of tricks, miniature scale models of a projected individual mount or habitat group have been made as studies for the finished work. Mr. Jonas, in his career as a leading taxidermist and sculptor, preserved his sketches of this kind, adhered to a uniform scale of one-tenth life-size for all his pieces, carried the work to a higher degree of finish than customary, and thus built up a collection that is unique.

The collection is certainly the most extensive of its kind, although the number of mammals represented is but a fraction of those known. It also excels in the accuracy and craftsmanship with which individual pieces have been made.

In developing his collection of animals in miniature, Mr. Jonas has had its possible educational use in mind. One of the problems he had to solve was that of a satisfactory casting material to give lightness, durability, and relatively low cost to the models, because it was foreseen that classroom use would involve much handling of the models and consequent risk of breakage if they were reproduced in any of the standard materials. The answer was found in various formulations of self-vulcanizing rubber latex with which hollow casts may be made in plaster of Paris molds. Such casts have the strength and flexibility of a rubber doll and yet may express a fidelity to nature that only an experienced artist-taxidermist could give.

With this technical difficulty disposed of, the usefulness of accurately made scale models of animals for instructional purposes became greatly enhanced. With a comprehensive collection of such models, it is possible to make easily seen and understood arrangements in a small space to illustrate various aspects of animal relationships, from general appearance to taxonomic position, geographic distribution, and ecological relationships.

Even in a large museum with great exhibition space and tremendous resources in material, it is physically impossible to bring full-sized specimens in sufficiently close association to make all of these relationships apparent and clear to the average visitor who, it is feared, often fails to grasp the significance of the way exhibits are arranged in some museum halls. For this reason the animals of the Jonas collection have been arranged in conventional systematic order for exhibition despite the fact that the Museum has two large halls devoted to the same purpose. Beginning with the marsupials, typified by the kangaroo, and ending with the gorilla to illustrate the primates, seven orders and nineteen families of mammals are represented by the sixty-five separate models of the collection.

Five years ago, the N. W. Harris Public

THE SCULPTOR AT WORK

Louis Paul Jonas making one of the clay models used in preparation of his miniature animal sculptures, currently exhibited at the Museum. His assistant, Miss Phyllis Cole, holds a preliminary sketch of the animal. In the background are several completed miniature sculptures.

School Extension of this Museum began a project to use similar models of the large mammals as visual aids for certain units of instruction in the Chicago Public School curriculum. This project was interrupted by the war and the high priority on the use of natural rubber latex, but it will be resumed when conditions permit.

BEGAN WORK AT EARLY AGE

Louis Paul Jonas was born in Budapest in 1894, and began the study of sculpture at the early age of eleven. When he was fourteen, he was sent to the United States to join his brothers in Denver, where they had established themselves as taxidermists. His career was accelerated by joining the staff of the American Museum in 1913, where he worked with the late Carl E. Akeley, perhaps the most famous taxidermist who ever lived (chief taxidermist at this Museum, then Field Museum of Natural History, from 1898 to 1909). Jonas worked with Akeley on the American Museum's African Hall until his enlistment in the United States Army in World War I. Subsequent to the war, he returned to that museum, and later embarked upon his independent career. It is singularly appropriate, therefore, that the Jonas models should be exhibited in Carl E. Akeley Memorial Hall of this Museum dedicated to the memory of his preceptor.

One of the large animal groups in the Hall of Marine Mammals (Hall N)—that of walruses shown in a reproduction of their natural Arctic environment—was prepared by Mr. Jonas and his brothers some years ago. He has also prepared groups for the Colorado Natural History Museum in Denver, the Philadelphia Academy of Sciences, the California Academy of Sciences, various smaller museums, and many works for private collectors. He now has his studio at Lake Mahopac, New York, in a railroad station which he bought when the railroad discontinued stopping its trains in that community.

RARE BONGO ANTELOPE

A miniature by Louis Paul Jonas

A SOLDIER—ZOOLOGIST HOME FROM PACIFIC

Returned recently for a short visit home after nearly 30 months in the Solomons, Corporal William J. Beecher, former temporary assistant in the Department of Zoology, spent most of his furlough at the Museum working on his collections.

Although ten months of his overseas time was spent in combat areas, Corporal Beecher managed during his spare time to accumulate several hundred specimens of birds and mammals, most of which are new to the Museum collections. In addition, he has sent numerous collections of lizards, snakes and frogs from this little-known island group and persuaded other service men to do the same.

Corporal Beecher spent most of his time on Guadalcanal, Russell Islands, Rendova, New Georgia and Bougainville, but several months were spent in New Caledonia and a short time in New Zealand. At Rendova, where he went in on the beach in the first assault wave as a combat medical soldier, he still managed to collect.

He sometimes collected lizards during the repeated air raids directed at the concentrated beachhead on Rendova, but discreetly confined his collecting mainly to protected gullies.

Shortly after the Munda airstrip was secured, Corporal Beecher began painting the common animals and plants of the Solomons, especially the birds, since no popular literature for their identification existed. He painted some sixty species in twenty-four weeks during spare time amounting to about a day a week. The plates represent the first extensive attempt to paint the natural history of the Solomons and interpret it popularly.

ORNITHOLOGIST E. R. BLAKE WOUNDED IN ACTION

Mr. Emmet R. Blake, Assistant Curator of Birds, on leave from the Museum for service with the Army, has been wounded. He has been in action on the Italian, French and German fronts. In a letter received by Mrs. Hermon Dunlap Smith, Associate, Birds, just as this BULLETIN goes to press, Mr. Blake, whose last known title was Special Agent, War Department, writes:

"If my left-handed writing is only slightly neater than your typing, charge it to the 'Master Race' who finally got my range with 8-mm. high explosive shells near Wurzburg on the 5th (April). Some shrapnel hit me in the back near the lesser spare ribs, splashed off my pate and smashed my right hand. The fingers are O.K., so don't start looking for another Assistant Curator. My wounds are not at all serious; in fact, are best described as 'million dollar wounds' because they are neither maiming nor particularly painful, but will keep me out of further trouble for awhile. I am now in a large hospital somewhere in France and it promises to be a pleasant vacation."

Miss Elsie Lippincott, the Museum's Former Librarian, Dead

Miss Elsie Lippincott, Librarian of the Museum for thirty-three years, died February 22. She came to the Museum very early in its history (1897) and helped in laying the foundation of the Library, working through its early days and the hard years to make it of use to the members of the staff. Miss Lippincott was more than a librarian—she was also a friend, working with the staff, interested in their problems and desirous of accomplishing the most possible for them. Ill health compelled her to resign in 1930. Her kindly personality, helpfulness and efficiency in the administration of the Library are still remembered by many members of the Museum staff.

The equipment used by the children of China in their school work, and the clothes they wear, are illustrated by an exhibit, with life-size models of a typical boy and girl, in Hall 32.

Samples of barley and wheat from Mesopotamia, reputed to be 5,000 years old, and of other ancient wheat from the pyramids of Egypt, are exhibited in Hall 25.

AN UNUSUAL BIRD'S NEST FROM NEAR-BY INDIANA

By DESSIE P. MORROW
VOLUNTEER ASSISTANT, DIVISION OF BIRDS

In October of last year a nest of the red-eyed vireo was found in a deep wooded ravine at French Lick, Indiana. It was hanging about five and one-half inches from the ground in a maple sapling so close to a bridle-path that it must have been touched many times by the riders.

The red-eyed vireo always chooses a horizontal forked branch for its pensile nest and there is remarkable uniformity in its size and shape, but the use of materials differs greatly, and therein lies the interest of this nest, the outside of which is made almost entirely of snake skins. Thirty-

BIRD'S NEST OF SNAKE SKINS

Found in a maple sapling in a forest ravine at French Lick, Indiana. Thirty-three bird species in the world have been listed as using snake skins for their nests, but this is the first known example of one made by the red-eyed vireo.

three species of birds over the world have been listed as using snake skins in nest building, but the red-eyed vireo is not mentioned among them.

The female does the building and she must have found these cast-off skins in a warm sunny spot where the snakes had congregated in the early spring after their winter hibernation. She started her nest by hanging pieces of skin over the forked branch, fastening them down firmly with bleached threads of spider silk. This silk, originally of spider webs or cocoons, is pulled into fine threads by the bird. Thus she forms the entire outside, weaving in a few bits of fibrous material along with the skins. Across the base, reaching from side to side, is one solid strip of skin about one-half inch wide, forming an exceptionally firm nest. The inside is lined with bark or grass fibers, usually of the wild grape-vine.

It is a fancy to believe that birds use snake skins with any premeditated thought of warding off predatory animals. To them it is only useful material. Nor can a bird read, as we all know, but this fall in Lake Forest, Illinois, I found a mourning dove's nest built in its usually loose style, and under the top layer of twigs was a large piece of newspaper folded over many times and firmly flattened down. It was the front page of the *National-Union Baptist Review*, published in Nashville, Tennessee, dated January 2, 1943. Across the top was a headline reading: "The Dove of Peace May Hover Over the Universe in 1943."

A NEW "COMIC STRIP" IN HALL OF INDIANS

A new exhibit has been installed in Hall B, under the title, "Where the Indians Came From, When and Why." In place of a long printed label, a comic strip of fifteen pictures has been skillfully, tastefully and carefully used. The whole saga is told by this picture strip.

It was recently reported in *Time* that "facts presented in picture strips are (at first reading) grasped 10 per cent to 30 per cent more thoroughly than the same facts presented in words alone."

The Department of Anthropology was recently confronted with the task of presenting the story of the origin of the American Indians. We know fairly well the details of this great trek of Mongoloids from Asia to America and we know about when the first migration took place (some 20,000 years ago). However, none of the tools, equipment or gear of these first discoverers of America have ever been found. Their houses, tools, clothing and the like have been lost for all time or have long since turned to dust. Therefore, the only way of telling this epic story was by means of pictorial representation.

This has been done by means of two large maps—one of North America and one of Eastern Asia. On the maps there is shown the extent of glaciation at about 20,000 years ago, and drawings depict the extinct animals which roamed the continents at that time. Between the two continents is a large plaque bearing fifteen pictures done in the comic strip technique in color. These pictures show why some of the Asiatics were forced to leave Siberia, how they crossed over to America, and how they wended their way through a corridor in the glacier until they finally reached the Great Plains.

CHANGING YOUR ADDRESS?

Members of the Museum who change residence are urged to notify the Museum so that the BULLETIN and other communications may reach them promptly. A post card for this purpose is enclosed.

Members going away during the summer may have Museum matter sent to their temporary addresses.

ORR GOODSON, ACTING DIRECTOR, TO LEAVE THE MUSEUM

Mr. Orr Goodson, Acting Director, under whose supervision the Museum has been operated since late in May, 1942 when Army duties called Colonel Clifford C. Gregg, Director, away from Chicago, is leaving the Museum May 1. He will return to his former field of activity—building operation—having accepted a position as manager of a large Loop office building.

ORR GOODSON

Coming to the Museum as Assistant to the Director on July 1, 1941, Mr. Goodson was elected Acting Director when Director Gregg's Army assignment required his transfer from Chicago to other posts.

Under Mr. Goodson's direction, despite reduced staff and abnormal conditions, the Museum has not only maintained most of its usual activities but has continued growth and development comparing favorably with those of prewar years. He leaves with the good will and respect of all those who have been associated with him. It is not known when Colonel Gregg may be released from the Army, but it is hoped his return to the Museum may soon follow the departure of Mr. Goodson.

Dutch East Indies Exhibit Scheduled for June

The Chicago Natural History Museum, in co-operation with the Netherlands Information Service, is preparing to give Chicago an opportunity of seeing an extensive special exhibit relating to the Netherlands East Indies. Present plans call for this material to be placed on display here some time in June, to continue for at least sixty days.

The exhibit comprises material illustrating the natural history, ethnology, arts, industries, military significance, and other phases of life in the Jap-invaded Indies.

At the time of going to press with this issue of the BULLETIN, full details were not available, but efforts are being made to assure the opening of the special exhibit not later than June 15. A full account will appear in the next BULLETIN. A special preview is planned for members of the Museum, at which it is expected to present a troupe of native Balinese dancers. Members will receive advance notification of this event.

Wild pigs of various kinds, from Europe, the Philippines, New Guinea, Celebes, Africa, and South America, are the subject of an exhibit in Hall 15.

ORNITHOLOGICAL ILLUSTRATION FROM 1555 TO THE PRESENT

(A Special Exhibit Commemorating the 160th Anniversary of the Birth of John James Audubon, April 26, 1785)

By ELLEN T. SMITH
ASSOCIATE, DIVISION OF BIRDS

John James Audubon was born 160 years ago, on April 26, 1785.

For the dual purpose of celebrating this anniversary, and of marking the annual spring return of migratory birds to the Chicago area, the Museum's Division of Birds has installed a special exhibit (*which will continue until June 4*) of rare and valuable books showing many of the most striking examples of illustrations, mostly in colors, made through several centuries.

MALACHITE KINGFISHER, ETHIOPIA

Painted by the late Louis Agassiz Fuertes on the Museum's Ethiopian Expedition sponsored by the Chicago Daily News in 1926-27. In the current exhibit of bird prints.

Everyone knows of, and loves Audubon, and with reason. In the first place, he was a romantic character, pioneering in the wilds of middle western America with his charming wife Lucy, painting indefatigably the birds of America, as he saw them and studied them. In the second place, his sense of color and design combined with his accuracy of observation made his pictures decorative and beautiful from an artistic point of view, as well as from that of a scientific contribution. Further, Audubon was extremely particular about the reproduction of his paintings. He had them engraved on copper plates and colored by hand, at a time when lithography and color printing were well developed. Though the work was enthusiastically started by Lizars in Edinburgh, one of the finest engravers of the day, Audubon was not satisfied, and after only the first ten plates had been completed he took the rest to the Havells in London.

How did Audubon happen to develop his special art? Who and what went before him to pave the way, and who came after him? The answers to these questions are to be found in books—big books, little books, elephant folios, strangely shaped volumes—representing man's interest in the birds that he sees around him and in the strange creatures of foreign lands; books written and illustrated by men with an insatiable curiosity, and a desire to impart their knowledge to others.

In the 15th, 16th, and 17th centuries, groups of these men were filled with the urge to combine in one work all the scientific knowledge of the world. They are called "the encyclopaedists," and they flourished in an age of territorial expansion, when new lands were being discovered, with brilliant and exciting heretofore unknown flora and fauna. The new printing presses were put to use describing these strange countries and printing the learned works of the encyclopaedists, which for the most part were illustrated by woodcuts.

Captains and travelers wrote of their voyages, illustrating their letters with pen sketches. Penguins looked like geese to them, so for many years a penguin was known and pictured as "Magellan's Goose."

Some of the most amusing drawings are the contemporary sketches of the Dodo, and though the portraits vary somewhat, they all have one thing in common—the stupid expression on the face of the poor bird which has been extinct for nearly 300 years. In 1906, Walter Rothschild published a book on extinct birds, and included a collection of all the contemporary tales and sketches of the Dodo.

The art of bird illustration obviously follows the study of natural history in general and ornithology in particular. It is also dependent on the technique developed to reproduce the artist's original painting. Woodcuts, although skillfully handled by such men as Bewick (*British Birds*, 1797) and Jacques (*Birds Across the Sky*, 1942) were not generally well adapted to bird portrayal.

By 1700, engraving from copper plates had come into widespread use; and thus we have Mark Catesby's *Natural History of Carolina, Florida, and the Bahamas*, two beautiful volumes full of hand colored engravings, each one seemingly lovelier than the last, which in coloring and design were remarkable forerunners of Audubon, though published 100 years earlier, in 1731.

Buffon's encyclopedic work on natural history, profusely illustrated with hand colored engravings, and the beautiful color printing developed in France in the 18th century, combined to stimulate bird art in that country to a point at which it became a definite center of ornithological illustration from about 1770 to 1830.

Meanwhile, in England four notable characters—John Ray, Gilbert White, John Selby, and Thomas Bewick—had aroused enormous interest in ornithology, and the early 19th Century saw Great Britain as a center of publication of bird books and bird illustrations.

This era was dawning when Audubon arrived from America with 435 of the most beautiful bird illustrations the world had ever seen. Each bird was pictured with natural environmental plant material, occupied in some characteristic action, on elephant folio paper, and the size adds greatly to the decorative value of the prints. Audubon's work attained immense popularity, and has been the inspiration of all who came after him.

The 19th Century was the Golden Age of bird illustration, nearly all of the books being folio or elephant folio size, and by 1890 the craze for depicting all the known species of birds had nearly accomplished that unbelievable feat. Two men are chiefly responsible for this, in widely different ways.

In 1796, Alois Senefelder was an obscure Bavarian actor and playwright. Ten years later his name was on the tongue of every printer and artist in Europe and America. Attempting to be his own printer and publisher, Senefelder experimented with plates, acids and inks, in an endeavor to save money. One day his mother asked him to write her laundry list. Alois picked up the nearest thing at hand—a smooth stone, and wrote the list with his greasy ink. A few hours later, curiosity led him to etch the stone and pull a proof, thereby discovering relief engraving on stone.

After two years of further experiments, he found he could get a print from the surface of the stone without etching, and so in 1798 lithography was born. Its advantages over previous methods of reproducing the original work of an artist, both in accuracy and in time saved, were so apparent that by 1806, with a few improvements, it had become an art and was universally adopted.

Lithography was made use of by the man who is easily the most prolific bird artist the world has yet known, John Gould. Gould's first work *Birds of the Himalaya Mountains*, was published in 1832, and his last, the supplement to the *Humming Birds* in 1882, a year after his death. In these fifty years, Gould was the author of ten major works on birds, the forty-two volumes containing 3,012 illustrations, all lithographs, which

with few exceptions are from original paintings by Gould himself.

Photography replaced bird prints to a large extent in ornithological books from 1890 on. The books became smaller and more usable, with text and actual photographs predominating.

Louis Agassiz Fuertes, who has been called Audubon's successor by many, and the greatest portrayer of birds that ever lived, dominated the modern period until his untimely death in 1927. Although his works are all smaller than Audubon's and the two cannot be compared in decorative effect, Fuertes surpasses Audubon in subtle expression of the character of birds he portrayed. With Fuertes leading the way, and the works of young American artists receiving well deserved praise and encouragement, 20th Century bird illustration thus far may be said to have reached its zenith in the United States.

SPECIAL EXHIBIT

A temporary exhibition of books designed to illustrate the chronological development of bird prints from 1555 to the present day is on view at the south end of George M. Pullman Hall (Hall 13). The exhibit opened April 17 and will continue until June 4.

One book, Willughby and Ray's *Ornithologia*, was graciously loaned by the John Crerar Library. All others are from the Museum Library which is open to the public during Museum hours except on Saturday afternoons, Sundays, and holidays.

The Museum extends its thanks to Mr. Arthur Ross and Mr. Harry Owens of the Lakeside Press, and to Mr. Carl O. Schniewind, Curator of Prints and Drawings at the Art Institute, for their help with labels and in determining the process used in printing many of the illustrations.

The Division of Birds is grateful for assistance given in preparing the exhibit by Mr. Albert Cohn of the Library; Miss Peggy Collings, artist; Mr. James R. Shouba, Assistant Superintendent of Maintenance, Mr. John R. Millar, Curator of the Harris Extension, Mr. Raymond Hallstein, Mr. Harold Grutzmacher, and Mr. Ray Herring of the Division of Printing, and of course to Mr. Karl P. Schmidt, Chief Curator of Zoology.

LONG-TAILED KINGFISHER, NEW GUINEA

Painted by Walter Alois Weber while a member of the Museum's Cornelius Crane Pacific Expedition in 1928-29. In the current exhibit of bird prints.

MOGOLLON CULTURE

Prehistoric Americans who lived in western New Mexico during a period dating from a thousand or so years before the Christian era to about A.D. 700 suffered physically from malnutrition due to inadequate diet. Mentally they tended to be "isolationists." These conclusions are reached by research into evidence unearthed by Dr. Paul S. Martin, Chief Curator of Anthropology, and associated archaeologists. The results are detailed in a 174-page book issued by the Museum Press—*The SU Site—Excavations at a Mogollon Village*. The research was conducted over several years by the Field Museum Archaeological Expeditions to the Southwest, led by Dr. Martin.

The SU site, where ancient ruins of several villages were excavated, is located in a canyon of the Apache National Forest. The people whose history was studied are an extinct Indian tribe known as the Mogollones. The extensive collections resulting from the excavations, including pottery, remains of old house types, human and animal burials, implements, and various other kinds of artifacts have been subjected to intensive investigation at the Museum, and to comparisons with similar material collected from sites representing other prehistoric cultures of this and near-by regions, some related to the Mogollon, and some distinct. The following brief excerpts from Dr. Martin's book give some picture of life as it was led by these early and little known inhabitants of the Southwest:

"Mogollon culture was an undeveloped, unsophisticated, unalloyed, unvarnished, homespun kind of culture with no striking or dramatic features. The general Mogollon cultural pattern was unadorned and lowly, and based on almost minimal requirements. It was homogeneous, non-expansive in that it probably sought no, or few contacts with other cultures ('isolationism'). I should guess that the people of this culture were mild, timid, retiring. . . . . When Pueblo Indian influences drifted into the Mogollon area, the resistance of the Mogollon culture was so mild that the Pueblo culture became the dominant one.

ARMY REPORTS SAFE RETURN OF BRYAN PATTERSON

T/5 Bryan Patterson, Curator of Paleontology on leave for service with the U.S. Army, reported missing in action January 19, has been safely returned to the American lines, the War Department has notified Mrs. Patterson.

In a message received April 28, General Ulio, Adjutant-General, telegraphed Mrs. Patterson: "The Secretary of War desires me to inform you that your husband T/5 Bryan Patterson returned to military control 2nd of April, 1945."

Earlier in the same week, Mrs. Patterson had received a letter giving the first account of how Mr. Patterson had disappeared. It stated that "Corporal Patterson was reported missing in action 19th January, 1945, during an attack against enemy positions near Faymonville, Belgium."

The differences in title apparently are accounted for by successive promotions in rank. Before he was reported missing, the Museum's information was that Mr. Patterson was a private first class.

PRESIDENT FIELD SERVING FOR 37TH YEAR

Re-elected at the Annual Meeting of the Board of Trustees, Mr. Stanley Field is now serving his thirty-seventh consecutive year as President of the Museum. All other Officers who served in 1944 were re-elected. They are: Mr. Albert A. Sprague, First Vice President; Mr. Silas H. Strawn, Second Vice President; Mr. Albert B. Dick, Jr., Third Vice President; Mr. Solomon A. Smith, Treasurer and Assistant Secretary.

No successor has to date been chosen to fill the place on the Board of Trustees left vacant by the death in France of Brigadier General Theodore Roosevelt. The board, as at present constituted, includes, besides the re-elected officers, Messrs. Sewell L. Avery, W. McCormick Blair, Leopold E. Block, Boardman Conover, Walter J. Cummings, Howard W. Fenton, Marshall Field, Charles A. McCulloch, William H. Mitchell, George A. Richardson, Albert H. Wetten, and John P. Wilson. Three others are absent on service in the Navy, namely: Commander Lester Armour, Lieutenant Joseph N. Field, and Lieutenant Commander Samuel Insull, Jr. Mr. George A. Richardson has completed his service as a lieutenant-colonel with the Army Air Forces.

The effects on the earth's surface of snow and ice are illustrated by specimens in the physical geology collections on exhibition in Clarence Buckingham Hall (Hall 35).

Chicago Natural History Museum

FOUNDED BY MARSHALL FIELD, 1893
Roosevelt Road and Field Drive, Chicago
TELEPHONE: WABASH 9410

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* On leave to active service as a Colonel in the United States Army.

THE BULLETIN

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CONTRIBUTING EDITORS

PAUL S. MARTIN.....*Chief Curator of Anthropology*
B. E. DAHLGREN.....*Chief Curator of Botany*
PAUL O. MCGREW.....*Acting Chief Curator of Geology*
KARL P. SCHMIDT.....*Chief Curator of Zoology*

MANAGING EDITOR

H. B. HARTE.....*Public Relations Counsel*

Members are requested to inform the Museum promptly of changes of address.

THE ILLINOIS STATE MUSEUM

The day of old-fashioned static museums is past. Not only the very large institutions like those in New York, Chicago, and Washington, but those in smaller cities and those devoted mainly to local interests have become dynamic adjuncts to the general educational and cultural development of their publics.

The State Natural History Museum at Springfield, which was once only a dusty collection of minerals and fossil bones, is no exception. Although limited in funds and housed in public buildings mainly devoted to other purposes, it has grown to proportions and possibilities that should not be under-estimated.

Its crying need is for a building of its own, designed and constructed to meet modern conditions and guaranteeing fulfillment of the service for which it has demonstrated its potentiality. After studies by its board of advisors and officers, such a building has been designed by the state architect, and its cost with equipment is estimated at $2,000,000.

It remains for the right-thinking and forward-looking citizens of the state to endorse the project to their General Assembly and secure its approval. As one of the richest and most populous states in the Union, Illinois should not be laggard in taking its place among others that have provided for institutions of this kind.

The time appears to be now, since the present museum has reached the limit of development within the housing now available. Already it has amassed collections valued at more than a million dollars, it has a small staff of experts, it publishes a journal of considerable circulation, it provides traveling exhibits for schools as well as public lectures on science and travel, and it co-operates with the State Geological Survey, the State Natural History Survey, and the State Archaeological Society. Expansion along all these lines is to be hoped for.

The State Museum has a unique function in that its primary effort is directed toward the special field within the state's own boundaries. No other institution can or will cover this field thoroughly, and it is to the practical interest of the state as a whole to encourage its further development. Aside from its direct co-operative relation to various state activities, it is practical because for Illinoisans to "know their Illinois" means that all America will know it better. It is also practical because it promotes state pride which is powerful although intangible.

In the difficult post-war period that lies ahead of us, material prosperity and the bread-and-butter problems of simple living are sure to receive ample attention and there is little doubt that they will be solved. It would be a mistake, however, in our zeal for individual welfare, to neglect movements which are broadly educational and character-building and hence tending to the high ideals which are essential to a peaceful and culturally advanced world. In its State Museum, Illinois has an opportunity to promote something not only of immediate value, but something affecting the permanent long-time advancement of its people for generations to come.

Staff Notes

Mr. Karl P. Schmidt, Chief Curator of Zoology, is on a field trip of several weeks' duration, in Mexico and Texas.

Dr. Paul O. McGrew, Acting Chief Curator of Geology, spent five weeks in scientific institutions in Texas, Oklahoma and Kansas, engaged in research on fossil horses.

Dr. Wilfred H. Osgood, Curator Emeritus of Zoology, has returned from some weeks in Mexico.

Mr. Frank C. Wonder has been promoted to a position as Staff Taxidermist. He had served for a number of years as Assistant Taxidermist.

Dr. Wilfrid D. Hambly, Curator of African Ethnology, was recently called to Washington for consultation by the National Research Council in connection with post-war plans for Africa.

Mr. Llewelyn Williams, Curator of Economic Botany, who has been on leave for special work in South America for the U.S. government for several years, has finished that work and returned to his post at the Museum.

THE MUSEUM HONOR ROLL

Now in the Nation's Service

Army

CLIFFORD C. GREGG, Director—Colonel, G.S.C.
DR. JOHN RINALDO, Associate, Southwestern Archaeol.—Staff Sgt.
DR. SHARAT K. ROY, Curator, Geol.—Capt.
D. DWIGHT DAVIS, Curator, Anat. and Osteol.—Corp.
BRYAN PATTERSON, Curator, Paleontology—Pfc. (*Reported missing in action since Jan. 19, 1945*)
EMMET R. BLAKE, Asst. Curator, Birds—Special Agent, War Dept.
RUPERT L. WENZEL, Asst. Curator, Insects—Capt.
HENRY S. DYBAS, Assistant, Insects—Sgt.
WILLIAM BEECHER, Temp. Asst., Zool.—Corp.
HENRY HORBACK, Asst., Geol.—S. Sgt.
JAMES C. MCINTYRE, Guard—2nd Lt.
RAYMOND J. CONNORS, Guard—Pvt.
FRANK J. DUTKOVIC, Janitor—Pvt.

Navy

LESTER ARMOUR, Trustee—Comdr.
SAMUEL INSULL, JR., Trustee—Lieut. Comdr.
JOSEPH NASH FIELD, Trustee—Lieut.
COLIN CAMPBELL SANBORN, Curator, Mammals—Lieut.
DR. ALEXANDER SPOEHR, Curator, N. Amer. Ethnol.—Lieut.
LOREN P. WOODS, Asst. Curator, Fishes—Lieut. (j.g.)
JOHN W. MOYER, Taxidermist—Ch. Specialist (Bur. Aeronautics)
JAMES H. QUINN, Chief Preparator, Paleontol.—Metalsmith 2C
PATRICK T. MCENERY, Guard—Master Gunner
CLYDE JAMES NASH, Guard—Master Gunner
NICHOLAS REPAR, Printer—Aviation Machinist's Mate 1C.
MORRIS JOHNSON, Carpenter—Carpenter's Mate 1C.
HERBERT NELSON, Painter—Painter 1C.
ELIZABETH BEST, Guide-Lecturer—Lieut. (j.g.), WAVES
MARIE B. PABST, Guide-Lecturer—Lieut. (j.g.), WAVES

Marine Corps

MELVIN A. TRAYLOR, JR. Associate, Birds—Capt.

Coast Guard

M. C. DARNALL, Jr., Guard—Lieut. (j.g.)
JOHN MCGINNIS, Guard—Ch. Boatswain's Mate

Other Services

RUDYERD BOULTON, Curator, Birds—Staff of Office of Strategic Services
BRYANT MATHER, Asst. Curator, Mineralogy—Civilian Worker, Corps of Engineers, U.S. Army
LLEWELYN WILLIAMS, Curator of Economic Botany—on special service for U.S. Government
DR. JULIAN A. STEYERMARK, Asst. Curator, Herbarium—field work for Board of Economic Warfare
DR. C. MARTIN WILBUR, Curator, Chinese Archaeol. and Ethnol.—Staff of Office of Strategic Services

Died in Service:

THEODORE ROOSEVELT, Trustee—Brig. Gen., U.S.A.
GEORGE JAHRAND, Guard—Ch. Machinist, U.S.N.

Completed War Service:

GEORGE A. RICHARDSON, Trustee—Lt. Col., U.S.A.
JOHN SYCKOWSKI, Guard—Ch. Commissary Stewd., U.S. Navy

"ROMANCE OF WOOD" ENDS SUNDAY LECTURE SEASON

"The Romance of Wood," an entirely new subject not presented in any of his previous seasons, will be offered as the Sunday afternoon lecture of Paul G. Dallwig during May. This will be the concluding presentation in the Layman Lecture series for the current season; Mr. Dallwig will resume lectures on Sundays next November.

Mr. Dallwig supplies the following summary of what he intends to cover in "The Romance of Wood":

He will tell the romantic history of our ancient forests and how they served our pioneer settlers; and will relate the interesting history of pulpwood, plywood and veneers. He will also explain the difference between hardwood and softwood, and the terms "solid," "veneer," "genuine" and "imitation" as applied to mahogany and walnut. In addition, he will explain the startling new scientific discoveries making it possible to twist, bend or mold wood like clay, yet make it as hard as steel and smooth as glass. As a special feature he will dramatize early logging operations—the life in the camp bunkhouses, as well as the actual felling of the timber in the forest, and the log drive.

Lectures begin at 3 P.M. (an hour later than in previous seasons) in the lecture hall. The heavy demand by the public, and the necessary limitation of audiences to the accommodations, make it essential to require advance reservations. Lectures are restricted to adults, and children cannot be admitted. Persons desiring to attend are advised to apply several weeks in advance by mail or telephone (WABash 9410).

PENICILLIN

By WILLIAM A. DAILY

(Mr. Daily, of the Biological Research Division, Eli Lilly and Company, Indianapolis, Indiana, has been a frequent visitor to the Museum's cryptogamic herbarium since 1939, doing research on algae. He is now working on penicillin in the Lilly laboratories.)

In 1929, Alexander Fleming of St. Mary's Hospital in London proposed the name "penicillin" for the powerful antibacterial agent produced during growth of the blue mold, *Penicillium notatum* Westling. For approximately ten years following Fleming's brilliant work, his results were not followed up by other investigators and the study of mold antibiotics was left dormant, mainly because of the sudden appearance of the sulfa drugs. However, research was revived by British scientists, notably Florey and his colleagues, and subsequently many Americans turned their attention to the problem.

The production of penicillin is a difficult process influenced by a host of factors. Briefly, the mold selected for its high potency is inoculated into suitable media and grown at optimum conditions to produce abundant spores. When these are mature, they are transferred aseptically to liquid media.

Penicillin has been obtained by "surface" culture in small bottles containing about a pint of liquid or, more recently, by "submerged" culture in huge aerated tanks containing thousands of gallons of media. The antibacterial substance exuded into the media during growth of the mold is extracted and refined by a long, complicated process.

The finished commercial product is a deep reddish-orange powder. Potency is lost rapidly while in the liquid state; therefore, penicillin is dried *in vacuo* as a sodium or calcium salt and stored as such. When ready for use, the powder is dissolved in saline solution to produce a yellow liquid. It is an acid with a faint but characteristic odor and bitter taste.

Therapeutically, penicillin is effective when administered locally, as well as intravenously. It is most valuable in the treatment of those diseases caused by the pus-forming bacteria. The organisms responsible for pneumonia, meningitis, gonorrhea, and syphilis are rapidly killed or inhibited in growth by its action, while those causing typhoid fever and a form of food poisoning are less sensitive. Some, such as those producing plague, cholera, dysentery, and tuberculosis, are quite insensitive.

Future research will determine more nearly the full therapeutic value of this timely drug which has equaled and in many instances surpassed the sulfa compounds in usefulness.

AFRICAN LEG MAKEUP

The subject of leg makeup, of all things, has attracted the attention of the Museum's Department of Anthropology. Dr. Wilfrid D. Hambly, Curator of African Ethnology, comments that American girls' complacent assumption of originality in their solution of the problem caused by lack of nylons and silk, is quite unjustified.

The idea was anticipated years ago by policemen—African tribesmen civilized and trained for police work, and used in the service of the government of Nigeria (British West Africa). Likewise, Africans enlisted as soldiers in the service of the British Empire completed their uniforms with leg makeup of a sort, says Dr. Hambly, as a result of observations made some years ago when he conducted the Frederick H. Rawson West African Expedition.

"The uniform of the Nigerian police was a dark blue, with knee breeches, and blue puttees," said Dr. Hambly. "But more often than not the feet were bare, yet they were resplendent with an unnatural jet black luster. Indeed, no shoes were worn, for all the toes were visible, but at a distance there was a remarkable effect of wearing patent leather shoes polished to a dazzlingly high degree.

"The solution of this mystery came unexpectedly during an early morning visit to a government station where a number of police were preparing for parade. All their feet were up on a low wooden bench, and shoe polish was being liberally applied to the bare pedal extremities up to the lower edge of the puttees. The men then vigorously brushed until the skin of their feet and ankles assumed a polished surface."

MOYER IN ACTION

From *The Analog*, publication of the U.S. Naval Air Station, Anacostia, D.C., the following news has been received about Mr. John W. Moyer, Museum Staff Taxidermist, on leave for service in the Navy:

"Several months ago C.Sp. John W. Moyer was lugging cameras and other varied photographic equipment through North Africa, Italy, England, and France. Sent on this tour by the Bureau of Medicine and Surgery, his photographic records on 16 mm. color film deal mostly with the Army and its medicine. Eight types of wounds common to the Mediterranean area were chosen, and a complete record of treatment was photographed. Everything in connection with the wound from its occurrence to the evacuation of the injured man back to the U.S. was recorded. Chief Moyer was on a number of hospital ships, including the newest one afloat. . . . .

JOHN W. MOYER
C. Sp., USNR

"After spending three weeks in the southern part of England where robot bombs were everyday occurrences, Chief Moyer learned to respect this Nazi revenge instrument. He says it was not a pleasant experience, for the robot bomb is actually more terrifying and more horrible than anyone who has not seen its effects can imagine.

"On the brighter side, however, is the Chief's report that in all of his eight months of travel and work on this series of pictures concerning *Medicine in Action* he did not see a man die on the operating table, and only one who had been brought in for treatment. He believes that 98 per cent of the wounded men live."

LECTURE TOURS ON WEEKDAYS IN MAY AND JUNE

Conducted tours of exhibits, under the guidance of staff lecturers, are made every afternoon at 2 o'clock, except Sundays and certain holidays. On Mondays, Tuesdays, Thursdays, and Saturdays, general tours are given, covering all departments. Special subjects are offered on Wednesdays and Fridays; a schedule of these follows:

May

Wed., May 2—By-Products of the War—Shortages Create New Ideas for Using Primitive Products (*Mrs. Roberta Cramer*).

Fri., May 4—Meet the People—Our Neighbors Around the World (*Emma Neve*).

Wed., May 9—Story of Garden Plants (*Miriam Wood*).

Fri., May 11—What Fossils Tell Us (*Velma D. Whipple*).

Wed., May 16—The Unseen Museum—Stories About the Cases (*Emma Neve*).

Fri., May 18—True Fish Stories (*Miriam Wood*).

Wed., May 23—Native Homes of Circus Animals (*Velma D. Whipple*).

Fri., May 25—Agriculture and Foods Among Primitive Peoples (*Mrs. Roberta Cramer*).

Wed., May 30—Memorial Day—*no tour.*

June

Fri., June 1—The Shrinking World—Travel and Exploration (*Emma Neve*).

Wed., June 6—Brilliant Blossoms—The Showiest of Flowers (*Miriam Wood*).

Fri., June 8—Sons of Han—Our Chinese Allies (*Emma Neve*).

Wed., June 13—Birds and Their Homes (*Velma D. Whipple*).

Fri., June 15—The Land of Montezuma—Colorful Mexico (*Mrs. Roberta Cramer*).

Wed., June 20—The Americas (*Mrs. Roberta Cramer*).

Fri., June 22—Expedition Tails and Tales (*Velma D. Whipple*).

Wed., June 27—Along the Ancient Routes of Silks, Spices, and Gold (*Mrs. Roberta Cramer*).

Fri., June 29—Bathing Beaches—Swimmers Past and Present (*Velma D. Whipple*).

GIFTS TO THE MUSEUM

Following is a list of some of the principal gifts received during the last two months:

Department of Anthropology

From: Benjamin B. Felix, Dundee, Ill.—4 pieces of pottery, Yucatan, Mexico; Lt. Comdr. Ward E. Guest, U. S. Navy—6 ethnological specimens, New Hebrides; Mrs. E. G. Gibson, Momence, Ill.—a barbed fish spearhead of whalebone, Yahgan tribe, Tierra del Fuego.

Department of Botany

From: New York Botanical Garden, New York—305 herbarium specimens, Costa Rica; Dr. Earl E. Sherff, Chicago—21 herbarium specimens, Hawaii; Hermann C. Benke, Chicago—130 herbarium specimens, Illinois, Wisconsin, Indiana, Kansas, and Oklahoma; U. S. Forest Service, Washington, D. C.—363 herbarium specimens, Ecuador, and one from Costa Rica; Escuela Agricola Panamericana, Tegucigalpa, Honduras—2,300 herbarium specimens, Honduras.

Department of Geology

From: M. C. Thoroman, Columbia Falls, Mont.—16 geological specimens, Montana; Mrs. A. J. Kudrua, Berwyn, Ill.—a specimen of tin ore, South Dakota; Donald Bannon, Chicago—a specimen of marl, Canal Zone; Mrs. E. A. Russell, Chicago—a jade ornament; Fernando Paba, Medellin, Colombia—3 specimens of bituminous coal, Colombia.

Department of Zoology

From: Edwin C. Galbreath, CPhM, U.S. Navy—4 fishes and a spiny-bellied spider, Marshall and Solomon Islands; Sgt. Henry S. Dybas, U. S. Army—112 lower invertebrates, Saipan, Mariana Islands; Corp. Eugene Ray, U. S. Army—16 snakes, geckos, crabs, and slugs, Philippine Islands; Lincoln Park Zoo, Chicago—9 birds and a California boa; Lt. Harry Hoogstraal and Stanley G. Jewett, Jr., U. S. Army—51 rodents and bats, New Guinea and Philippine Islands; Alan Solem, Oak Park, Ill.—2 shells, Mariana Islands; T/5 D. Dwight Davis, U. S. Army—a snake, Texas; Dr. Wesley R. Coe, La Jolla, Calif.—46 mussels, Pacific coast; Norman French, Springfield, Ill.—2 lizards, Arizona; Corp. William J. Beecher, U. S. Army—2 millipedes, Solomon Islands; S. A. Edgar, U. S. Army—64 shells and crustaceans, Eniwetok, Marshall Islands; The American Varnish Company, Chicago—a lizard in copal, Africa; Capt. Rupert L. Wenzel, U. S. Army—19 snakes and frogs, Brazil; C. M. Barber, Flint, Mich.—a soft-shelled turtle, Florida; E. C. Richardson, Chicago—a least weasel, Illinois; Laurence M. Klauber, San Diego, Calif.—2 lizards, Brazil; Chicago Zoological Society, Brookfield, Ill.—7 birds; Bernice P. Bishop Museum, Honolulu, Hawaii—2 land shells, Caroline Islands; E. Hagen, U. S. Army—10 fish specimens, Saipan, Mariana Islands.

Library:

From: American Fuchsia Society, San Francisco, Calif.; Emil Beer, Berwyn, Ill.; A. B. Du Mont, Passaic, N. J.; Essex Ornithological Club, Salem, Mass.; Mrs. M. R. Harned, Rockford, Ill.; James Hornell, St. Leonard-on-Sea, England; Theodor Just, Notre Dame, Ind.; Dr. Angel Maldonado, Lima, Peru; Manitoba Department of Mines and Natural Resources, Winnipeg, Canada; Eliot G. Mears, Stanford University, Calif.; North American Insurance Company, Philadelphia, Pa.; Professor E. L. Palmer, Ithaca, N. Y.; Lieut. Colin C. Sanborn, U. S. Navy; Walter P. Taylor, College Station, Tex.; Wells-Dickey Company, St. Louis, Mo.; Capt. Rupert L. Wenzel, U. S. Army; Wyoming Game and Fish, Cheyenne, Wyo.; Office of Strategic Services, Inter-American Development Commission, Dr. Henry Field, and Leon Kelso, all of Washington, D.C;. J. F. McLaughlin and Western Union Telegraph Company, New York; and B. N. Benesh, Boardman Conover, Dr. A. E. Emerson, Miss H. Elizabeth Story, and Robert Yule, all of Chicago.

NEW MEMBERS

The following persons became Members of the Museum during the period from February 12 to April 13:

Associate Members

Randolph Bohrer, Miss Fannie S. Johnston, Walter S. McCloud, Robert K. Mielenz, James L. Palmer, Dr. Theodore R. VanDellen.

Annual Members

F. W. Adams, Henry Bengston, Garrett L. Bergen, Fred G. Bovee, Miss Ruth M. Burull, Mrs. Evelyn Butler, Arthur G. Dale, Charles R. Drake, Leonard Dubkin, Dr. Marguerite S. Flores, Herbert S. Futran, William Gallauer, Werner H. Grabbe, William H. Grigg, Miss Marian Hegg, Charles H. Hocking, Paul Kay, Robert A. Kirkman, Leo Krumdieck, Mrs. John W. Mathews, Quinlan J. McNall, Donald F. Moore, Miss Frances M. Mullin, Francis L. Newton, James L. Newton, Robert B. Overend, Reuben L. Perin, Miss Frances Poe, Robert C. Preble, Romolo Roberti, John Roggenkamp, Alphons J. Scheuber, Bertha M. Scholl, Miss Elizabeth J. Spencer, Joseph L. Strong, Hugo Stumpp, Dr. Paul E. Thal, Philip R. Toomin, Irving S. Toplon, Hy Wasserman, Paul G. Waterhouse, Mrs. Henry J. Way, Michael Wayne.

Anthropologists Meet

The Museum was host on April 6 to a meeting of the Chicago Anthropological Society, held in the lecture hall. Seventy-five members of the profession attended. Mr. George I. Quimby, Jr., Curator of Exhibits in the Museum's Department of Anthropology, was chairman of the committee of arrangements.

Death of Dr. L. H. Shattuck

The administrative officers and staff of the Chicago Natural History Museum join with those of their sister institutions of this city in an expression of regret over the death of Dr. L. Hubbard Shattuck, Director of the Museum of the Chicago Historical Society on March 29. Dr. Shattuck had made an enviable record in his field, achieved great success in administering the Society's museum, and had been prominent in many other civic and national activities. In the joint relationships engaged in between the various museums of Chicago, he had been notably friendly and co-operative.

Visiting Hours Change May 1

Beginning May 1, summer visiting hours, 9 A.M. to 6 P.M., will go into effect until September 3 (Labor Day).

(R) PRINTED BY CHICAGO NATURAL HISTORY MUSEUM PRESS

Chicago Natural History Museum
BULLETIN
Formerly Field Museum News

Vol. 16 JULY-AUGUST, 1945 Nos. 7-8

IN INLAND CHICAGO—THE WHALES OF ALL THE WORLD'S SEAS AND OCEANS

By KARL P. SCHMIDT
CHIEF CURATOR, DEPARTMENT OF ZOOLOGY

Whales have been of such great economic importance to man, and their pursuit is so spectacular and in former times was such a dangerous trade, that the very word "whale" is almost as familiar as "dog" and "cat." The first group of visitors to the new Hall of Whales (Hall N-1) in the Museum was a class in American literature, which had been studying the novelist Herman Melville whose "Moby Dick" is probably the most famous of all whales. The newly opened hall, preparation of which has been under way for the last five years, is adjacent to one containing habitat groups of other marine mammals (Hall N), and this in turn leads into the Halls of Fishes (O) and of Marine Invertebrates (M).

The vast size of whales, and their considerable variety, present a major problem for museum exhibition, and in order to present a conspectus of the whales of the world in the space available, it has been necessary to scale the larger whale models to one-tenth natural size. The smaller types of toothed whales, known as porpoises or dolphins, are shown in life-size models. All have been prepared in carefully painted plaster casts from models in clay.

The wall space above the cases has been used for simple murals showing interesting features about whales, such as a mother whale nursing its young, killer whales attacking the bowhead whale, and porpoises playing about the bow of a ship. A large mural at the end of the hall presents the most dramatic moment of the pursuit of whales by sailing ship and whaleboat, when the whaleboat is held against the whale's very side until the hand lance is driven to its heart. Further accessories in the hall include a case of whaling tools, and the novel "scrimshaws" and "jagging wheels" carved from whales' teeth by the sailors on their long voyages.

Represented in the hall are most of the distinct types of whales in the seas (approximately one-half of the species and subspecies of whales now known).

IN THE DAYS OF THE WHALERS

Large mural by Staff Artist Arthur G. Rueckert in the new Hall of Whales. It depicts the dramatic and hazardous moment when the men in the whaleboat come alongside the harpooned giant of the sea to drive the hand lance into its heart.

Many who know that whales are the largest animals living in the world today are unaware that they are the largest animals *ever* known, either of living or extinct creatures—far larger even than the greatest of the dinosaurs, reptilian giants of the prehistoric world.

To give an easy measure of comparison in the hall, figures of men in whaling ship regalia, scaled to represent six-footers in ratio to the one-tenth size whale models, are displayed with them.

Whales fall into two sharply defined groups, toothed and whaleboned whales. The toothed species feed on fishes, squids, or even larger animals. Whalebone whales

MUSEUM ARTIST AT WORK

Arthur G. Rueckert, Staff Artist of the Museum, painting one of the mural sketches decorating the now completed Hall of Whales. The sketch illustrates how small killer whales attack a giant bowhead whale.

have instead of teeth a whalebone sieve to strain the smaller creatures from the surface waters of the sea. Their principal food, known to whalers as "krill," is composed of various crustaceans, some no more than one-fifteenth of an inch in length. Smaller schooling fishes such as anchovies, sardines, and herring are also engulfed and strained out of the water by these consumers of sea-food.

The staple food of the sperm whale, largest of the toothed types, appears to be gigantic squids rarely seen by man, which are pursued in the twilight zone of the sea at a depth of about 300 feet.

Among the larger species of whales represented in the one-tenth size museum models are: The blackfish or pilot whale, which swims in great schools of as many as a thousand individuals that sometimes become stranded in shallow water; the killer whale, "wolf of the sea," which attacks its fellow large whales as well as such smaller creatures as porpoises, seals, and penguins; the sperm whale, largest of toothed whales; the pigmy sperm whale; the right whale; Cuvier's beaked whale; the Arctic white whale; the humpback whale, most stout-bodied of all with a flattened snout (a sort of Hermann Goering of the whales), which once was of great importance to the whaling industry; the California gray whale; the slender finback or rorqual; the sei whale; the little piked whale; the pigmy right whale; the blue whale, largest animal ever known to have lived either among extant or extinct species on either land or sea; the bowhead whale; the Atlantic bottle-nose, and the narwhal which is armed with a long straight spearlike tusk.

The curious courtship antics of the humpback whales are well known to whalers. An amorous pair lie alongside of each other and deal each other alternate love taps with their sixteen-foot flippers. These resounding taps make a thunderous sound that can be heard for miles over the sea.

The museum curator serves so large a function as a question answerer to the general public, as well as to text-book writers, editors of encyclopedias and magazines, and reporters, that some of the more familar questions and answers have been drawn up below.

Q. Are whales fishes?

A. No.

This is one of the most familar of questions asked of museum curators, and the reply, that whales are *not* fishes, is sometimes met with skepticism. The question, in fact, involves the meaning of words and the divergence between popular names and scientific classifications, for in Old English any creature of the sea was a fish. This meaning of the word "fish" persists in starfish, jellyfish, shellfish, etc., and these creatures are much less closely related to what the zoologist calls "true fishes" than are whales. Whales and the true fishes at least agree in having backbones as a fundamental characteristic.

Q. If not fishes, what are whales?

A. Mammals.

Mammals have warm blood, hair, and suckle their young with milk from the "mammae." Whales have warm blood, a few vestiges of the hair coat (sometimes only two hairs), and suckle their young. Whales are thus really more closely related to mice and men than to fishes or reptiles.

Q. To what other mammals are whales most nearly related?

A. We don't know.

The earliest known fossil whales have strong teeth, but they are already wholly aquatic mammals; our best guess is that they arose from the central stock of mammals that produced both the flesh-eaters and the hoofed mammals. There is so little connection between the whalebone whales (which have no teeth) and the toothed whales that it has been suggested that these two types had an independent origin from land-dwelling ancestors.

Q. What is the largest whale?

A. The blue whale.

Often known also as the sulphur-bottom, this whale reaches a length of more than 100 feet and a weight of more than 150 tons.

Q. What is the smallest known whale?

A. The Yangtze River porpoise.

This species reaches a length of only about five feet.

Q. What kind of whale was Moby Dick?

A. The legendary white whale was described as a gigantic sperm whale.

Presumably it had grown white with age.

Q. How do whales swim?

A. By sculling.

That is, by diagonal down strokes of the tail. Undulation, like the side-to-side swimming movement of a fish, does not seem to be employed.

Q. How do whales breathe?

A. Whales breathe air (like all mammals).

The "spouting" or "blowing" of whales is the exhaled air made visible by the condensation of water vapor when it meets the cool outer air and is released from the pressure of the whale's lungs. Water is not spouted out, as is often assumed.

Q. How large is a baby whale?

A. Depends on the kind of whale.

But the newly born young is astonishingly large in comparison with its mother. The young blue whale at birth measures 23 to 26 feet in length and weighs three to four tons.

Q. How fast do whales grow?

A. Very rapidly.

The young blue whale measures more than 50 feet when it is weaned, about seven months after birth.

Q. How deep do whales dive?

A. At least a half-mile below the surface.

THE BLUE WHALE

This species represents the whalebone division of the whale tribe. It is also the largest of whales, and, in fact, the largest of all animals known on land or sea, either of living or extinct species.

THE SPERM WHALE

This species represents the toothed varieties of whales, and is the largest of them. It was one of the most sought after by whalers, and is the species to which the famous "Moby Dick" belonged.

The record was made by a sperm whale that became entangled in a submarine cable off the coast of Colombia at a depth of more than 3,000 feet.

Q. How fast do whales swim?

A. Up to 18 knots.

The blue whale can swim at about 12 knots, with bursts of speed up to 14 knots; the smaller whales, like the dolphins may be much swifter. The common dolphin is said to pass ships at more than 18 knots.

Q. Why does man hunt whales?

A. Mainly for their oil.

The oil is tried out of the layer of fat (blubber) beneath the skin, with by-products of meat used as food and fertilizer from the rest of the carcass.

Q. What is "whalebone?"

A. Whalebone is not bone, but the horny plate material suspended from the roof of the mouth in the toothless whales.

It forms a strainer to let the water pass out and retain the small creatures of the sea for food.

Q. Is whalebone still used in corsets?

A. Apparently not.

The use for this purpose in the great days of the corset almost led to the extinction of the bowhead whale, which produced the finest whalebone.

Q. Do whales have a tiny throat?

A. The opening of the throat is small in the whalebone whales but large in the toothed whales.

A large killer whale (30 feet or so in length) could easily have swallowed Jonah.

Q. What whale is supposed to have swallowed Jonah?

A. None.

The Bible reports Jonah to have been swallowed by a "great fish."

Q. What do whales eat?

A. The whalebone whales eat the smaller fishes and tiny crustaceans and mollusks of the sea. The toothed whales feed on large and small fishes and many eat squids.

The sperm whale apparently feeds mainly on a giant squid that swims at a depth of several hundred feet.

Q. Are sea cows whales?

A. No.

They are an entirely distinct group of mammals that have taken to the sea. They are related to the elephants.

Q. Are porpoises and dolphins whales?

A. Yes.

That is, in a broad sense, whales include these smaller types.

Q. How long do whales live?

A. No one knows much about this.

A famous dolphin in New Zealand was a well-known harbor character for 32 years.

Q. What enemies do whales have?

A. The only important enemy of whales besides man is the killer whale.

The killer whale attacks even the largest whales by ganging up on them, and it regularly feeds on the smaller porpoises and dolphins.

Q. What is ambergris?

A. Ambergris is a curious substance apparently produced only in the intestines of sick whales.

It is sometimes found cast up on the beach. It was formerly valuable in perfume making, but has now been displaced by synthetic chemicals.

Q. Where are whales found?

A. In all parts of the oceans.

Populations of regions vary in more or less direct proportion to the abundance of the whales' food in any particular locality. Since the small floating animals of the sea are especially abundant in polar seas, the whalebone whales are most abundant in the Arctic and Antarctic.

Q. Do whales occur in rivers?

A. All the great tropical rivers have freshwater dolphins.

Often special kinds are found in specific river systems.

Q. What are "scrimshaws" and "jagging wheels?"

A. The product of whaling-ship sailors' leisure time.

Scrimshaws are decorated sperm whale teeth, engraved by the sailors on the long whaling voyages of the early part of the 19th century, intended for mantel shelf bric-a-brac. Jagging wheels are elaborately decorated pie-crimpers made from cut sections of sperm whale tooth. These objects are such favorites among collectors that it is difficult to obtain specimens.

Two additional cases at the end of the hall are in preparation to supplement the series of models. These cases will present skeletons, anatomical models, and other material to illustrate topics in the natural history of whales.

The models are the work of Mr. C. J. Albrecht, former Staff Taxidermist, and the painting of both models and murals is by Mr. Arthur G. Rueckert, Staff Artist.

BACKGROUNDS OF WAR AND PEACE

(Summer Programs for Adults on Sunday Afternoons)

For the past three summers, to meet the widespread demands for authentic information about the geography, peoples, flora and fauna of regions where the war is being fought, the Museum has presented series of programs under the title "Backgrounds of the War."

These have proved so popular that during July and August this year the series will be resumed. However, to accommodate larger audiences and provide a time meeting the convenience of a larger segment of the public, the programs will be given on *Sunday* afternoons at 2:30 (instead of Thursdays, as hitherto). In harmony with the efforts being made to achieve an international peace organization the title has been changed to "Backgrounds of War and Peace."

The new series will be presented in the James Simpson Theatre where *seats will be reserved for members of this institution until the hour of the program*, after which time all seats remaining unoccupied will be made available to the public.

The programs will combine documentary motion pictures with lectures by members of the staff of the Raymond Foundation. Following are the dates and subjects:

July 15—IN THE WAKE OF WAR (Motion pictures, including a captured Japanese film in which the Japanese narrator destroys our complacency). Introduced by Miss Miriam Wood.

July 22—WAR AND PEACE IN THE PACIFIC (Still and motion pictures from New Guinea and the Solomon Islands). Commentary by Mrs. Roberta Cramer.

July 29—SEEDS OF CONFLICT IN THE EAST (Korea, Manchukuo and China). Introduction by Miss Emma Neve.

August 5—RUSSIA AND HER PEOPLE (Motion pictures). Introduction by Mr. Bert E. Grove.

August 12—REDISCOVERING SOUTH AMERICA (Motion pictures of South American development including the Walt Disney interpretative film "The Amazon Awakens"). Introduction by Mrs. Roberta Cramer.

August 19—MEET YOUR AMERICA (The land of 150 million people—motion pictures). Introduction and conclusion by Miss Miriam Wood.

DUTCH EAST INDIES EXHIBIT, JUNE 30–SEPTEMBER 4

The life of the peoples of the Netherlands East Indies—their history since the year 1600, their cultures and religions, arts and crafts, industries and products, and the progress they have made in the modern world—is the subject of a comprehensive and elaborate special exhibit which was opened to the public in Stanley Field Hall of the Museum on June 30. The exhibit also covers the animal and plant life and the geological features of the Indies.

On June 29, a preview, to which all Members of the Museum received invitations, was held.

The public exhibition will continue through Labor Day, September 3.

The exhibit is presented under the auspices of the Netherlands Information Bureau, an agency of the Netherlands government. Twenty panels of striking and artistic photographs of large size, many of them in natural colors, and a number of paintings are included. These are arranged in a series extending from the north entrance of the Museum along the east side of the hall for about half its length, then across the hall, and back the west side to the entrance. Charts and graphs present informative data in concise form.

Netherlands Information Bureau photograph

BALINESE CEREMONIAL DANCERS

Museum Collection Also

Co-ordinated with this display are six cases of material from the Museum's own exhibits, collected by expeditions this institution conducted in The Netherlands East Indies. This material embraces flora and fauna, products, and arts and crafts of Java, Sumatra, Bali, and other Pacific colonies of the Netherlands. These are but a small sampling of the vast collections which the Museum possesses from the area, it being impractical to transfer temporarily any large part of these exhibits from their permanent installations. Visitors, after completing a survey of this special exhibit, may continue on to a more comprehensive study of the region by visiting Hall G on the ground floor of the Museum, which contains permanent exhibits of material collected by expeditions in the Malay Peninsula and Malay Archipelago, including the area treated in the special exhibit, plus other regions besides the Dutch colonies.

The panels in the government exhibit are 4 × 8 feet in dimensions, and are hinged like a Chinese screen. The photographs and charts are mounted on tasteful backgrounds of characteristic batik design. The exhibit bridges the history of the Dutch East Indies from about 1600 to the present. All of the peoples and language groups of the islands are covered. The birds, mammals, reptiles and plants are likewise represented.

The special preview program on June 29—to which were invited, besides the membership of the Museum, His Excellency Dr. A. Loudon, the Ambassador of the Netherlands to the United States; Hon. Jan A. Schuurman, Netherlands Consul-General in Chicago; the staffs of all foreign consulates in Chicago, directors of other museums, other special guests, and the press—opened in the James Simpson Theatre of the Museum. Mr. Stanley Field, President of the Museum, made the address of welcome. A short lecture was then given by Professor Fay-Cooper Cole, anthropologist of the University of Chicago and Research Associate in Malaysian Ethnology at the Museum.

Native Dances Presented

The stage of the Theatre then became the scene for a presentation of typical dances of Bali and Java by Devi-Dja and her famed troupe of girl dancers, accompanied by native musicians with the typical instruments used in the islands. Featured with them was the well-known male dancer, Soekoro, also of the Indies, brought especially from New York by the Netherlands Information Bureau for this occasion. The Devi-Dja troupe is well known in Chicago. These dancers were stranded in America while on tour at the time of the Japanese attack on their homeland. Faced with the necessity of remaining here for the duration of the war, they established a Chicago dining and entertainment spot.

Following the theater program, the audience was conducted to the special exhibit and also the permanent exhibits in Hall G. Lecturers of the Raymond Foundation were assigned to escort groups and answer questions.

It is hoped that all Members of the Museum who were unable to attend the preview will take the opportunity of visiting the exhibit during the two months it is to continue here for the benefit of the public.

Summary of the Exhibit

The Netherlands East Indies Exhibition endeavors to give the visitor a comprehensive view of Indonesian life. The first panel shows a map of the Archipelago superimposed on a map of the United States drawn in the same scale, giving the visitor an idea of the size of the country. Comparative population and square mileage figures also appear on this panel which has a border of photographs depicting typical landscapes. Each photograph is keyed to the map with captions and Roman numerals so the visitor can find immediately to which island a particular photograph refers.

The next three panels depict the flora and fauna of the islands and were painted by Mr. Joseph Guerry of the American Museum of Natural History, New York. One shows a selection of the most important and colorful indigenous animals superimposed on a flat background map of the Indies. Birds and plants which sustain life appear on the other two panels.

The next five panels deal with the life of the people who formed the population of the islands before the Europeans entered the country. First appears a short statement on the ethnology of the area by Professor Fay-Cooper Cole. A small map corresponds to the text, and is surrounded by photographs of the various racial types to be found on the islands.

Religions, illustrated through photographs of temples and various ceremonies, appear on the next panel, together with short statements on the number of adherents of the four major creeds.

A typical day in the life of an Indonesian villager is colorfully illustrated on a succeeding panel, while the importance of the Dance and the Theater is pointed out through short statements and accompanying photographs on the following panel.

The following sections endeavor to point out the influence and changes brought about by the Europeans. Two panels deal with the government set-up as it appeared before the Japanese invasion. On them, it is pointed out that the Indonesian, whether literate or not, elects his own representative government.

The next panel, through pictographs and photo-enlargement, illustrates the state of education and its recent increase within the last three decades. This panel also contains a small graphic outline of the system of education in which the indigenous language schools and the Dutch language schools are shown to run parallel. The great difficulty in educating a population which uses some 250 different languages explains the necessity for this multilingual effort.

The endeavors made to preserve the ancient culture of the islands are depicted on a following panel. The restoration of the Boro Budur and other temples, the republication of the classics, and the dances and ancient games re-introduced into the public schools are all part of this effort.

The extent of the public health services and their influence on the daily life and welfare of the population form the subject of a separate panel. Due to the lack of interracial strife and war, improved health conditions and consequent low mortality rate caused a serious problem of overpopulation in Java, one of the most densely populated areas of the world. How this problem was solved by partial industrialization and through emigration to other islands is established through photographs.

Applied Science

Three following panels show how modern science and importation of non-indigenous plants have contributed to the welfare of the Indonesian population.

Modern developments in architecture and communications are self-explanatory in a series of carefully selected photographs.

The last panel shows the obvious differences between the "Old" and the "New" in the life of the area.

The backgrounds for the panels were painted by Mr. Gerard Hordijk, noted Dutch painter, and are enlarged versions of actual Dutch East Indian batiks.

Mr. John R. Millar, Curator of the N. W. Harris Public School Extension, installed and integrated the Dutch government exhibits with the selected Museum collection.

SEASONAL LIFE OF LAKES INDIANS GRAPHICALLY TREATED

By GEORGE I. QUIMBY
CURATOR OF EXHIBITS, DEPARTMENT OF ANTHROPOLOGY

A new, and distinctly different-type exhibit in the Hall of American Archaeology (Hall B) tells a picture-book story of Indian life in the Upper Great Lakes region during the period about A.D. 1400–1700.

In the new exhibit which is entitled "Seasonal Life of Northern Indians," the story of these Indians is told visually rather than verbally. The differences between the summer and winter activities of these Indians is dramatically shown by means of two small stylized dioramas which are an integral part of the exhibit. They convey information which otherwise would have to appear on a long printed label. The actual archaeological specimens, excavated from old village or burial sites of these Indians, are arranged in meaningful groups in combination with the two dioramas. Such a combination is unique. Probably this is the first time that this method of exhibition has ever been used.

The exhibit is the work of Chief Curator Paul S. Martin, Curator Donald Collier, Artist Gustaf Dalstrom, and the writer.

The Indians of the Lakes region made their living mostly by hunting, fishing, and the gathering of wild foods, but some of them planted corn in the summertime. They made tools, weapons, utensils, and ornaments of stone, bone, wood, copper, and pottery. They lived in conical or dome-shaped wigwams made of poles covered with bark, skins, or mats.

The dead were buried in cemeteries or were covered by mounds of earth, the largest of which were about ten feet high and a hundred feet in diameter.

These Indians probably were the ancestors of such tribes as the Dakota Sioux, Ojibwa, Ottawa, Nipissing, Missisauga, Potawatomi, and Menomini, some of whom were described by the early French explorers of the Upper Great Lakes region.

The seasonal variation in the life of these Indians was very great. In summer time the Indian family groups would come from the interior and assemble in villages along the shores of the Great Lakes. Although the Indians preferred to live in villages, it was only in summer that they had enough food to do so. They obtained their food by planting corn, fishing, hunting, and the gathering of plants, roots, nuts, and berries.

The scarcity of food in winter made it necessary for the village to break up into family hunting bands. And each of these family bands wandered over a separate hunting territory in search of game.

In summer, the Indians traveled in birch canoes. In winter the Indians walked on snowshoes and hauled loads on toboggans.

Ceremonial life and burying of the dead occurred in summer. If an Indian died in winter, his body was placed on a scaffold or in a tree. Later the remains were gathered, wrapped in skin or bark, and taken to the place of burial.

Summer clothing was reduced to a minimum of breechclout and moccasins. In winter the Indians wore leggings, sleeves, skirts, robes, and animal skin moccasins.

ANOTHER INNOVATION IN ANTHROPOLOGY

Adding to its many recent new developments, the Department of Anthropology has installed this exhibit in the Hall of New World Archaeology. Thus, for the first time, diorama technique is combined with systematic artifacts.

Chicago Natural History Museum

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Members are requested to inform the Museum promptly of changes of address.

COLONEL GREGG RETURNS AS MUSEUM DIRECTOR

Colonel Clifford C. Gregg, Director of the Museum, who for several years past has been on leave for service with the Army, returned to his post at the Museum May 14.

As a reserve officer who had served in the first World War, Colonel Gregg was called to active service with the Army on September 1, 1940. For twenty-one months thereafter he served in the Adjutant General's department of the Sixth Service Command in Chicago and during that period he maintained his connection as Director of the Museum.

COL. C. C. GREGG

In May, 1942, the Army transferred him to duty at posts distant from Chicago. He was G-1 of the Tank Destroyer Center at Camp Hood, Texas; later he was transferred to Headquarters Army Ground Forces in Washington, D.C., where he became Chief of the Enlisted Division, G-1 Section. During the interim, Mr. Orr Goodson was appointed Acting Director, and served in that capacity until April 30 of this year.

When Colonel Gregg entered on extended active duty it was with a commission as major. During his term of service he was successively promoted to the rank of lieutenant-colonel and to his present rank, colonel. He was detailed to the General Staff Corps in October, 1942, and has served on the general staff since that time.

Colonel Gregg was elected Director and Secretary of the Museum in 1937. He has been a member of the staff since 1926.

Navy Promotes Lester Armour

Mr. Lester Armour, a Trustee of the Museum now in service with the Navy, has been promoted from Commander to Captain.

Staff Notes

Captain Sharat K. Roy of the Army Air Forces (on leave from his Museum post as Curator of Geology) is now stationed somewhere in India. He is the combat intelligence officer of his squadron. Captain Roy writes in part: "Here I am in the land of mystery. . . . While here, I think I can do some real service for the Departments of Geology and Anthropology, and perhaps other departments of the Museum, too. . . ."

T/5 Bryan Patterson (Curator of Paleontology on leave for service with the U.S. Army) spent part of a 60-day furlough at the Museum. Reported missing in action in Belgium last January, Corporal Patterson was furloughed after being safely returned to the American lines. He had spent several weeks in a Nazi prison camp, during which time he suffered from malnutrition, but his health has now been restored.

Dr. Paul O. McGrew, Acting Chief Curator of Paleontology, has returned from a six weeks' research trip, during which he made studies of fossil horse material at leading museums and universities in the eastern United States and Canada.

Cycad Collection Received

The cycad material gathered over many years by the late Professor Charles J. Chamberlin, of the Department of Botany, University of Chicago, has been turned over by the University to this Museum for incorporation in the botanical collections.

The Museum as a Vacation Haven for Children

The problem of what to do with children during the long summer vacation from school is aggravated this year, according to reports, by the continued absence of mothers, older brothers and sisters, on war jobs. It may be solved partially by use of the Museum, it is suggested to parents faced with such difficulties.

The Museum has issued its annual invitation to parents, and to children themselves, to take advantage of the institution's facilities as a safe and enjoyable haven from the perils of traffic and the causes of juvenile delinquency.

THE MUSEUM HONOR ROLL

Now in the Nation's Service

Army

DR. JOHN RINALDO, Associate, Southwestern Archaeol.—Staff Sgt.
DR. SHARAT K. ROY, Curator, Geol.—Capt.
D. DWIGHT DAVIS, Curator, Anat. and Osteol.—Corp.
BRYAN PATTERSON, Curator, Paleontology—Corp.
EMMET R. BLAKE, Asst. Curator, Birds—Special Agent, War Dept.
RUPERT L. WENZEL, Asst. Curator, Insects—Capt.
HENRY S. DYBAS, Assistant, Insects—Sgt.
WILLIAM BEECHER, Temp. Asst., Zool.—Corp.
HENRY HORBACK, Asst., Geol.—S. Sgt.
JAMES C. MCINTYRE, Guard—2nd Lt.
RAYMOND J. CONNORS, Guard—Pvt.
FRANK J. DUTKOVIC, Janitor—Pvt.

Navy

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SAMUEL INSULL, JR., Trustee—Lieut. Comdr.
JOSEPH NASH FIELD, Trustee—Lieut.
COLIN CAMPBELL SANBORN, Curator, Mammals—Lieut.
DR. ALEXANDER SPOEHR, Curator, N. Amer. Ethnol.—Lieut.
LOREN P. WOODS, Asst. Curator, Fishes—Lieut. (j.g.)
JOHN W. MOYER, Taxidermist—Ch. Specialist (Bur. Aeronautics)
JAMES H. QUINN, Chief Preparator, Paleontol.—Metalsmith 2C
PATRICK T. MCENERY, Guard—Master Gunner
NICHOLAS REPAR, Printer—Aviation Machinist's Mate 1C.
HERBERT NELSON, Painter—Painter 1C.
ELIZABETH BEST, Guide-Lecturer—Lieut. (j.g.), WAVES
MARIE B. PABST, Guide-Lecturer—Lieut. (j.g.), WAVES

Marine Corps

MELVIN A. TRAYLOR, JR. Associate, Birds—Capt.

Coast Guard

M. C. DARNALL, Jr., Guard—Lieut. (j.g.)
JOHN MCGINNIS, Guard—Ch. Boatswain's Mate

Other Services

RUDYERD BOULTON, Curator, Birds—Staff of Office of Strategic Services
BRYANT MATHER, Asst. Curator, Mineralogy—Civilian Worker, Corps of Engineers, U.S. Army
DR. JULIAN A. STEYERMARK, Asst. Curator, Herbarium—field work for Board of Economic Warfare
DR. C. MARTIN WILBUR, Curator, Chinese Archaeol. and Ethnol.—Staff of Office of Strategic Services

Died in Service:

THEODORE ROOSEVELT, Trustee—Brig. Gen., U.S.A.
GEORGE JAHRAND, Guard—Ch. Machinist, U.S.N.

Completed War Service:

GEORGE A. RICHARDSON, Trustee—Lt. Col., U.S.A.
CLIFFORD C. GREGG, Director—Colonel, G.S.C., U.S.A.
JOHN SYCKOWSKI, Guard—Ch. Commissary Stewd., U.S. Navy
MORRIS JOHNSON, Carpenter—Carpenter's Mate 1C., U.S.N.R.
LLEWELYN WILLIAMS, Curator of Economic Botany—special service for U.S. Government
BERT E. GROVE, Guide-Lecturer—American Field Service and Pvt., U.S. Army

MUSEUM-UNIVERSITY PROGRAM OF CO-OPERATION RATIFIED

Plans of the University of Chicago and the Museum for co-operation in fields of mutual interest have been ratified by the Boards of Trustees of both institutions.

Co-ordination will include teaching and research in the sciences in which both institutions are engaged, closer relationships between staffs, a unified program to build up and consolidate collections, and experiments in visual education.

Members of the two staffs will co-ordinate efforts in fields of joint interest. Teaching will be conducted where it can be done most effectively, either at the Museum or at the University. Collections will be consolidated, with the University donating or loaning its materials.

The agreement provides for consideration of other areas of co-operation, including award of fellowships in such studies as anthropology, botany, paleontology, and zoology, with the fellows dividing their time between formal study in the University and participation in Museum work.

Co-operative arrangements with Northwestern University have also been discussed and a broad arrangement for their development has been made. It is hoped that other educational institutions in the Chicago region may be drawn into similar functional relations with the Museum.

BOTANICAL ADVENTURES IN VENEZUELA

The Department of Botany of the Chicago Natural History Museum will benefit from a recent expedition conducted in the mountain ranges of the northeastern area of Venezuela where little botanical collecting has previously been done. The expedition was conducted by Dr. Julian A. Steyermark, Assistant Curator of the Herbarium.

Dr. Steyermark, who was on leave from the Museum to perform special work for the United States government as an agent of the Board of Economic Warfare, recently completed that mission. Subsequently, he was engaged by the Ministry of Agriculture of Venezuela to conduct field work and research on the botanical resources of that country.

"I had a most interesting and successful trip," Dr. Steyermark writes. "My 2,000 numbers include a set for the National Herbarium in Caracas, and, in addition a complete set for the Museum. . . . I secured a large number of trees, shrubs, and lianas, as well as orchids, bromeliads, and aroids. I had a large number of trees cut down throughout the territory I visited in the states of Sucre, Monagas, and Anzoategui, all in the Oriente of Venezuela.

NO PREVIOUS COLLECTING

"There has been practically no collecting from this area previously, and about three-fourths of the material represents species hitherto unknown from this part of Venezuela. . . .

"I climbed to the summit of all three peaks of Cerro Turumiquire, the highest mountain of the coastal cordillera in Venezuela, and will have abundant material for a forthcoming report on the flora of Turumiquire and surrounding cerros. I can also report that I am the first botanist to have climbed two other high peaks in that region, namely, Cerro Negro and Cerro Peonia or Pajaritos. The latter had a phenomenon on its summit which may be unique in the records of Venezuelan entomology. I refer to the billions of semi-dormant hibernating wasps covering the trees on the summit of Cerro Peonia or Pajaritos.

"When I first reached the summit, I saw large dark brown masses of color in large portions of the tree trunks, branches, and among the leaves. At first they resembled some of the epiphytic mosses or hepaticae one often sees in cloud forests, but upon closer inspection I was amazed to find that they were masses of wasps huddled together with their brown wings folded and touching each other; their bodies were prostrate over the trunk or branches.

"RAIN OF WASPS"

"There were a large number of trees of which I wished to secure specimens, but the men were afraid to fell them because every blow of the ax resulted in a rain of wasps by the thousands. Many trees had to be ignored because the entire trunk was covered with the wasps.

"The ones we did cut were selected ones which had fewer (hundreds instead of thousands or millions) wasps than the others, but even these were dangerous, because at every stroke of the ax down came wasps by the handfuls. We got stung many times. There was a dried up sphagnum bog on this summit and I got stung trying to grab specimens of terrestrial moss or sedges and other herbs, because the wasps were also in the moss on the ground and among moss-covered branches. Everywhere one walked on the summit among the bushes and suffruticose Hypericum and melastoms he would encounter wasps, because they would be in dangling masses suspended between the leaves. You cannot imagine a rarer experience to befall a collector of plants. It is the most unusual one I have ever had.

"PLANTED" BY BIRDS

"Another interesting experience I had was in visiting the famous Guacharo cave near Caripe, the one in which Humboldt discovered and described the Guacharo bird for the first time. It is the only cave-inhabiting, nocturnal, frugivorous bird known in the New World, and for many years was known only from this and another cave in Venezuela. Now many more caves with these birds in Venezuela have been discovered, and the distribution has been extended to Colombia, Peru, and some of the West Indies. I collected thirteen species of seeds in the cave, three of these being palmae and most of the others lauraceae.

"The birds occur in large numbers in the interior of the cave, nesting among the declivities of the walls, leaving the cave at night to seek trees having fruits with a soft exocarp and mesocarp, and returning with their mouths full to eat in the cave. The seeds fall to the ground and there germinate, after having been swallowed and expelled. It was a rare experience, indeed, to collect flowering plants in the dark interior of a cave. I have been in many caves in Missouri but this is the first time I've ever botanized phanerogams existing in a cave because of the birds which had brought them there."

NEW MEMBERS

The following persons became Members of the Museum during the period from April 16 to June 15.

Associate Members

William H. Beckman, Stewart Boal, Howard H. Darbo, David L. Harrington, W. O. Kurtz, Dr. Della M. MacMullen, Michael A. Powills, George J. Renaldi, Hugh Rodman, Henry B. Steele, Jr., Walter A. Wade, Peter L. Wentz, Percy Wilson.

Sustaining Members

David L. Shillinglaw

Annual Members

Themis Anagnost, Jospeh P. Antonow, Mrs. Jacob M. Arvey, Mrs. D. Arthur Baer, Francis G. Bichl, Jr., Mrs. Harry K. Blitzsten, W. J. Broderick, Dr. Allan G. Brodie, Abraham J. Clonick, E. A. Conaway, Victor Conquest, S. H. Crandell, James J. Daly, Mrs. Orville A. Dee, Karl A. Dingeldein, Miss Mima L. Donaldson, J. M. Doroshaw, Mrs. Seth C. Drake, John J. Dubek, Jr., Erwin F. Dygert, Edward L. Eckert, Mrs. William T. Faricy, Mrs. John N. Franz, Richard F. Friedeman, John W. Gatenby, Jr., Frank E. Gettleman, Mrs. Laura E. Gresham, Irwin D. Groak, Sherwood V. Hinman, Barney E. Hokin, Samuel E. Hokin, James P. Hume, Robert M. Jackman, Bernard F. Johnston, Elmer H. Karp, Nathan D. Kay, S. J. Klapman, Mrs. Robert E. Langford, Ray S. Launder, Walter Linke, Joseph Mack, Mrs. James Leo Mayer, A. G. McLaughlin, Donald McC. McNamara, William Nunne, Franklin R. Overmyer, Mrs. Magdalene M. Pershing, Dr. Algot G. Person, Mrs. J. L. Petrelli, S. R. Pletz, Morris A. Poll, Alfred J. Pondrom, Dr. Otto Porges, Dr. William E. Putz, J. K. Roberts, Emil B. Salberg, Allen C. Sauter, Rev. R. G. Schell, Frederick Schenck, Miss Nina E. Schlatter, Miss Elsie Schobinger, L. H. Schuyler, Donald W. Sharpe, Harry F. Shea, Edward W. Shepherd, William B. Stroup, Dr. Eugene A. Thayer, Martin Topaz, Dr. Kenneth C. Washburn, Charles K. Wassell, C. W. Waterman, Miss Ellen P. Wheelock, Holmes Wilson, Harvey E. Wood, Henry Paull Wood, John W. Wood.

NINE PROGRAMS FOR CHILDREN OFFERED THIS SUMMER

The James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures will present on Thursday mornings during July and August its annual summer series of nine free programs for children. Eight of the programs will be motion pictures, and one will be a special stage production by the well-known Proctor Puppets of Springfield, Illinois. Included among the puppets in the Proctors' presentation are types from countries such as Java, China, and India, as well as native American comic characters. Animated cartoons will be a feature of many of the motion picture programs.

The entertainments will be given in the James Simpson Theatre of the Museum, and each program will be given twice, at 10 A.M. and 11 A.M. in order to accommodate maximum audiences. Children are invited to come alone, accompanied by parents or other adults, or in groups from clubs and various centers. Admission is free. Following are the dates and titles of the various films:

July 5—LET'S SEE CHICAGO

Color and black and white pictures of Chicago as a summer vacation spot.

Also a cartoon.

July 11—ORPHANS OF THE NORTH

A story about a small girl in the interior of Alaska. She sees many wild animals.

July 19—PUPPET SHOW

The Proctor Puppets, of Springfield, Illinois.

July 26—LAND OF LIBERTY

More than a century and a half of the American story.

August 2—YOUTH TAKES TO WINGS

The story of flight from birds to planes.

August 9—KING AND THE SCULLERY MAID

Also a cartoon.

August 16—THE PASSING OF TIME

The story of telling time from the earliest days.

Also a cartoon.

August 23—WEDDING OF PALO

Picture of Eskimo life in Greenland.

August 30—AN ALL CARTOON PROGRAM

Cafeteria Service Improved

Service in the Museum Cafeteria has been improved by recent changes in the equipment and the method of handling patrons. A progressive line passing steam tables, and salad, dessert, etc. counters now expedites serving the public, and assures enforcement of the "first come, first served" rule which it was impossible to carry out under the system formerly employed.

GIFTS TO THE MUSEUM

Following is a list of some of the principal gifts received during the last two months:

Department of Anthropology

From: Mrs. Clarence C. Prentice, Lake Forest, Ill.—2 feathered baskets, Pomo Indians, California; Llewelyn Williams, Chicago—a wooden manioc grater, Kuripako tribe, Venezuela.

Department of Botany

From: L. J. King, Wooster, Ohio—325 specimens of cryptogams, Ohio and Indiana; Hermann C. Benke, Chicago—125 specimens of cryptogams, Wisconsin and Illinois; Robert Runyon, Brownsville, Tex.—33 specimens of algae, Texas; Dr. Richard W. Pohl, Colorado City, Tex.—14 specimens of algae, Texas; Dr. V. J. Chapman, Cambridge, England—80 specimens of myxophyceae, Jamaica; University of Chicago—the late Prof. Charles J. Chamberlain's collection of herbarium sheets, photographs, seeds, and preserved material of cycads; Prof. J. Soukup, Lima, Peru—42 herbarium specimens, Peru; Dr. Jose Cuatrecasas, Cali, Colombia—120 herbarium specimens, Colombia; Prof. José Eugenio Leite, Cidade de Salvador, Bahia, Brazil—69 herbarium specimens, Brazil; Museo Nacional, San José, Costa Rica—57 herbarium specimens, Costa Rica; Prof. E. Barros V., Concepcion, Chile—115 herbarium specimens, Chile.

Department of Geology

From: Emil Liljeblad, Indianapolis, Ind.—a specimen of orthoceras, Sweden; Eugene Mayfield, Chicago—a specimen of *annularia longifolio*, Illinois.

Department of Zoology

From: Lt. Harry Hoogstraal, U. S. Army—58 mammals, 41 fish, and 2 fresh water snails, Dutch New Guinea; the late Arthur Wolf Herz—175 insects, United States; Dr. Wilfred H. Osgood, Chicago—83 rodents, Mexico; J. G. Little, PhM3/c, U. S. Navy—2 blind snakes, Guam; Pfc. Kevin W. Marx, U. S. Army—2 lizards, 5 snakes, and a fish, New Caledonia and Pelau Island; S/Sgt. G. Banner, U. S. Army—30 lizards and 3 snakes, Molucca Islands; Chicago Zoological Society, Brookfield, Ill.—a Malayan bear, a waterbuck, a dingo, and 2 birds; Groh Brothers, Chicago—a domestic pigeon; Capt. Robert Traub, U. S. Army—2 bats, 30 insects, and a scorpion, India; Mrs. Frederick Greeley, Hondo, Tex.—27 specimens of land shells, Texas; T/5 William J. Beecher, U. S. Army—256 birdskins, Solomon Islands; Sid Buzennius, Berwyn, Ill.—a domestic pigeon; Charles Strebling, Lyons, Ill.—a domestic pigeon; Lewis W. Bell, Oak Park, Ill.—a domestic pigeon; Robert R. Boehland, Rockford, Ill.—2 domestic pigeons; H. Eric Buri, Birmingham, N. J.—a domestic pigeon; Walter O. Grant, Chicago—a domestic pigeon; Joseph N. Koehler, Chicago—a domestic and a common pigeon; Lt. (j.g.) Loren P. Woods, U. S. Navy—12 fish specimens, California; Charles D. Nelson, Grand Rapids, Mich.—20 specimens of exotic fresh water mussels; J. E. Johnson, Jr., Waco, Tex.—108 reptiles and amphibians, Texas; E. O. Miller, China Springs, Tex.—an earless lizard and a western massassauga, Texas; Corp. Michael H. Bevans, U. S. Army—2 lizards, Okinawa Shima; Pvt. Roger D. Mitchell, Wheaton, Ill.—2 lizards, Georgia, and 31 specimens of land shells, England; Dr. Graham P. DuShane, Chicago—17 newts, Illinois; Capt. Carl Mohr, U. S. Army—2 bats, Philippine Islands.

Raymond Foundation:

From: Robert Yule, Henniker, N. H.—392 kodachrome slides.

Library:

From: Edgar Anderson, St. Louis; Bernard Benesh, North Chicago, Ill.; A. M. Clark, Melbourne, Australia; Cleveland Press, Cleveland; H. Daniel, Medellin Carrera 51, Colombia; Ford Motor Company, Dearborn, Mich.; Carlton M. Herman, Sacramento, Calif.; Albert M. Klingman, Philadelphia; V. J. Carlos Lehmann, Popayan, Colombia; Oliverio M. de O. Pinto, São Paulo, Brazil; Frank E. Peabody, Berkeley, Calif.; Pittsburgh Plate Glass Company, Pittsburgh, Pa.; Raul Ringuelet, La Plata, Argentina; Dr. Daniel Rubin de la Borbolla, Mexico City; C. Van Riet Lowe, Johannesburg, South Africa; Celanese Corporation, Dr. Jesse J. Dossick, and Miss Frances E. Wynne, Bronx Park, New York; Carnegie Institution of Washington, Dr. Henry Field, and the Library of Congress, Washington, D.C.; and Col. Clifford C. Gregg, William J. Gerhard, Dr. Fritz Haas, Orr Goodson, Alex K. Wyatt, Dr. Fred Barkley, Dr. Reuben M. Strong, and Burgess Manning Company, all of Chicago.

SUMMER GUIDE-LECTURE TOURS MORNINGS AND AFTERNOONS

During July and August conducted tours of the exhibits, under the guidance of staff lecturers, will be given on a special schedule, as follows:

Mondays: 11 A.M., Plants Useful to Man; 2 P.M., General Tour (Exhibition halls, all Departments).

Tuesdays: 11 A.M., Animals the World Around; 2 P.M., General Tour.

Wednesdays: 11 A.M., The People of the World; 2 P.M., General Tour.

Thursdays: 11 A.M., and 2 P.M., General Tours.

Fridays: 11 A.M., Stories in Stones; 2 P.M., General Tour.

Persons wishing to participate should apply at North Entrance. Tours are free. There are no tours given on Saturdays, Sundays, or on July Fourth.

By pre-arrangement with the Director, special tours are available to parties of ten or more persons.

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DIORAMA SHOWS HOW THE INCAS LIVED BEFORE THE SPANISH CONQUEST

By DONALD COLLIER
CURATOR, SOUTH AMERICAN ETHNOLOGY AND ARCHAEOLOGY

One of the most brilliant and dramatic episodes in the discovery and colonization of the New World was the conquest of Peru in 1532 by Pizarro and his intrepid band of 190 warriors. At this time Peru was the center of the great Inca Empire, which extended from Colombia to central Chile, a distance of nearly 3,000 miles. The Spaniards were amazed not only by the vast store of golden treasure that they encountered, but also by the complex organization of the Inca state and the engineering skill of the Incas.

Inca civilization, as it was shortly before the coming of the Spaniards, is the subject of a diorama recently installed in the in the Hall of New World Archaeology (Hall B). The exhibit shows the everyday life and some of the more spectacular accomplishments of the Incas. The site of the diorama is at Ollantaytambo in the Urabamba Valley, high in the Andes of southern Peru and not far from Cuzco, capital of the empire.

AN ANDEAN VALLEY AT THE TIME OF THE INCAS

Diorama in miniature, recently placed on exhibition in the Hall of New World Archaeology (Hall B). It shows in detail the typical terraced farms, and the irrigation system, a suspension bridge and stone fortress which demonstrate the remarkable engineering skill and organizing ability of the early Indians of Peru.

The scene is dominated by the rugged Andes rising to snow-covered peaks more than 19,000 feet high. Elaborate systems of agricultural terraces, built to hold the soil and facilitate irrigation, extend from the edge of the river far up the mountain slopes. The ditches that carry water from high mountain streams to the heads of these terrace systems are cut into the solid rock in places, and where necessary are carried through tunnels and across the sheer faces of cliffs on stone aqueducts.

From a mountain shoulder juts a massive stone fortress built by the Incas to protect this corner of the empire from hostile tribes living down the river. Probably the structure served also as a temple. On a broad terrace below the fortress is the village of Ollantaytambo. It has the straight streets and meticulous symmetry so typical of Inca planning.

Near at hand the highway from Cuzco crosses the rushing river on a great suspension bridge that sways and vibrates in the wind. The foot-thick cables of maguey fiber hang from stone piers that rise from massive abutments built of carefully fitted, very large, polygonal stones. Above the end of the bridge are the stone houses with thatched roofs of the bridgekeeper and his family. In the yard and near-by, various homely activities are being carried on. Two of the women are offering corn beer (*chicha*) and parched corn to some llama drivers who have halted their pack train to refresh themselves before going on to the village market.

On the adjacent terraces are growing the staple crops of the locality—corn, beans, squash and chili peppers. Higher up on the mountain slopes are green fields of potatoes and quinoa. The latter is grown for its small, round seeds which are made into a kind of porridge and ground into flour. Farther down the valley, where it is warmer, tomatoes and manioc are grown.

The Urubamba Valley was one of many similar, thickly populated valleys within the Inca Empire. The realm was composed of formerly independent and linguistically diverse Indian tribes and kingdoms that had been conquered by the Incas.

The Incas, often called Quechuas from the name of their language, were originally a small but powerful tribe confined to the Cuzco Valley. Through a remarkable series of military campaigns and an effective program of political and social measures to assimilate the conquered peoples, they created a vast, closely-knit empire in which they were the ruling class. The hierarchy of administrative officials, from the governors of the four provinces of the empire to the humblest officials having supervision over ten families, was headed by the Sapa Inca or "Sole Emperor," who was head of church and state. The emperor was called

MODERN DESCENDANTS OF THE INCAS

This Peruvian family, encountered by Curator Collier on one of his expeditions to South America, speaks only the Quechua language inherited from prehistoric ancestors. The woman at the extreme right is spinning sheep's wool. These people live even today in villages such as that depicted in the Museum diorama on page 1, and under conditions similar to those prevailing before the Spanish conquest.

"Son of the Sun," as he was thought to be of divine birth and descended from the Sun, the chief Inca deity.

INCA CONQUEST METHODS

Upon conquering a new territory, the Incas disturbed as little as possible the local customs and beliefs. The native officials were incorporated into the imperial hierarchy, and the cult of the Sun was superimposed on the local religion. The land was divided into three parts, one for the support of the state, one for the Sun to sustain the Inca priesthood, and the largest portion for the support of the people.

Quechua was the official language and was disseminated so effectively among the conquered peoples that when the Spaniards arrived it had replaced the local languages in most of the empire. Transplanting of populations was practiced by the Incas, both to overcome disloyalty in conquered territories and to equalize over-population in certain districts.

SECURITY REPLACED LIBERTY

At the expense of personal liberty, the rigid control of life under the Incas brought about a considerable degree of security and general well-being of the conquered people. Provincial governors and lesser officials were held strictly responsible for the welfare of those under them, and the efficiency and honesty with which they carried out their duties was constantly checked by traveling inspectors. Famine was prevented by a system of great storehouses throughout the land from which food could be drawn in case of crop failure.

Communication between the capital and all parts of the realm was maintained by an extraordinary system of roads. Two main highways stretched the length of the empire, one along the coast, the other in the highland. Numerous lateral and secondary roads connected the two main highways and formed a network converging on Cuzco.

At intervals of about fifteen miles along the highways there were *tambos* or inns for the accommodation of official travelers. These had facilities for eating and sleeping, as well as storehouses stocked with food, clothing and arms. Every two or three miles there were posthouses staffed by couriers who ran at top speed to the next post with messages and small burdens. By means of this "pony express" system of post-runners, messages and objects could be carried great distances at incredible speed. It is said that messages were transmitted from Quito to Cuzco, a distance of 1,300–1,400 miles by road, in ten days. Fresh fish were brought 200 miles to the emperor's table from Lake Titicaca or from the ocean. Even quicker communication was achieved by means of smoke or fire signals. A rebellion 1,800 miles from the capital could be reported to the emperor within two or three hours.

MORE ADVANCED THAN EUROPE

It is clear that Inca means of communication and travel were far superior to those of contemporary Europe. Under the Spaniards the Inca road system fell into decay, and fifty years after the conquest isolation was as great as in pre-Inca times. Not until the Pan American highway and the other current roadbuilding programs of the Andean countries are completed will ground travel in the Andes be as convenient and direct as it was under the Incas.

Despite their great skill in civil and social engineering, the Incas possessed no system of writing. The nearest approach to writing was the *quipu*, a counting device consisting of a thick cord from which hung knotted strings of different colors. The quipu operated on the same principle as the abacus, the colors of the strings representing different classes of objects, and the number and position of the knots indicating numbers according to a decimal system.

The great extent of this empire and the high degree of integration within it suggest that a long historical development lay back of the Inca state at the time of the Spanish conquest. Yet the flowering of the empire was very rapid. Cuzco and the Inca dynasty were founded about A.D. 1150. But the primary expansion of the empire took place between about 1400 and 1525, and the greater part of the territory was conquered in little more than thirty years.

The conquest of Peru by Pizarro was made easy by the fact that he found the country in a state of civil war. After two half-brothers, rival claimants to the throne, had been killed, the Spaniards were able to overrun Peru with comparative ease.

The Inca Empire at its height contained 10,000,000 to 15,000,000 inhabitants. Following the Spanish conquest there was a great reduction in population. But a gradual recovery followed and today the Andean Indians are probably about as numerous as they were under the Incas.

Although the Spaniards destroyed the Inca government, the religious organization and the specialized culture of the Incas, the Quechua language and many of the customs and beliefs of the people have persisted to the present.

VILLAGE LIFE TODAY

The village of Ollantaytambo, shown in the diorama, is still inhabited and looks much the same today, despite the addition of a Catholic church and here and there a tile or corrugated iron roof. The terraces in the valley continue to be farmed and are still fertile after 500 years of cultivation.

The Peruvian diorama is the second of a series of four being constructed for Hall B by Mr. Alfred Lee Rowell, of the Department of Anthropology staff. A set of kodachrome slides secured through the courtesy of Mr. René d'Harnoncourt was of great assistance. Members of the Departments of Botany and Zoology gave technical advice. Taxidermist Leon L. Walters did the plastic casting of the river.

NEW MEMBERS

The following persons became Members of the Museum during the period from June 16 to August 3:

Associate Members

Norman Asher, Mrs. Leon Grotowski, Mrs. Norman R. Hanson, Mrs. Barney E. Hokin, W. P. Rogovsky.

Annual Members

Mrs. William S. Adler, Mrs. William G. Agar, George M. Armstrong, Mrs. Pierce Atwater, Clarence Avildsen, Mrs. Albert H. Barber, Timothy A. Barrett, Norbert Basler, Mrs. A. E. Bastien, Hugh C. Beelman, Mrs. Bert R. Benjamin, Beryl Bleeden, Mrs. Louis A. Boening, Claude D. Bowman, William M. Carlington, Frank R. Curda, Dr. Maurice L. Dale, Luery Etshokin, Douglas B. Ferris, Charles G. Forck, Arthur E. Gast, Samuel R. Gettleman, Theodore Gilbert, Oscar L. Grisamore, W. J. Halligan, Charles M. Hanna, Mrs. Paul V. Harper, Miss Lois E. Hobart, Frank Richard Klann, Philip A. Klapman, Richard Levy, Richard D. Linville, Charles C. Livingston, DeWitt J. Manasse, Mrs. Russell L. Mannette, Dr. Irene T. Mead, Mrs. Helen W. Munsert, T. E. Murchison, William James O'Neal, John Paul Pennebaker, Samuel Penner, J. B. Roberts, Miss Vaughn Rook, Samuel Rosenstone, Thomas W. Saunders, Albert J. Tarrson, Dr. Henry S. Testin, Thomas Tighe, Paul R. Unger, Harry W. Williams, Frank C. Wolff.

PHOTO EXHIBIT SCHEDULED AT MUSEUM IN FEBRUARY

Chicago Natural History Museum has made its facilities available for the exhibition of photographs selected for display in the First Chicago International Salon of Nature Photography, under the auspices of the Chicago Nature Camera Club, with the participation of the Chicago Horticultural Society and Garden Center.

The exhibit will be held in Stanley Field Hall, January 28 to February 28 inclusive.

Entries may be submitted at once, and all must be received by January 10 to be eligible for consideration. They may be addressed to the Salon in care of the Museum, Roosevelt Road and Field Drive, Chicago 5. The entry fee is $1, for which a maximum of 4 prints and 6 color slides may be submitted; *checks and money orders should be made payable to the Chicago Nature Camera Club.* The club has arranged for participation by associated clubs throughout this country and other nations, but membership in one of these clubs is not a requirement of eligibility for entrants.

Photographs and color slides in six classifications are desired:

Plant life—flowers, trees, shrubs, fungi, etc. (but *not* gardens in this division).

Animal life—mammals, birds, insects, reptiles, tracks, etc.

Scenery—with particular emphasis on geological aspects and natural phenomena.

Gardens—especially Victory Gardens and their products.

Anthropology—ethnological and archaeological subjects; primitive man, native habitations, sites of ancient cultures and civilizations, etc.

Color slides—any subjects in the foregoing classifications.

A number of accepted pictures will be reproduced in the *Journal of the Photographic Society of America*, and elsewhere. A committee of five judges will be named, and prizes will be awarded by the Chicago Nature Camera Club and the Chicago Horticultural Society.

SHANGRI-LA IN NEW GUINEA FOUND YEARS AGO

New evidence has shown that Hidden Valley, supposedly discovered by the United States Army Air Forces last year in the mountains of central Dutch New Guinea, was actually first entered by white men 25 years ago, and the "Shangri-la" area was discovered and thoroughly explored by Americans in 1938. Considerable space has been devoted in the press to the marooning there of a WAC and two other Army personnel as the result of a plane crash.

When the first reports on this "Shangri-la" were published, it was evident that it lay in the region explored by the Richard Archbold Expedition in 1938. This expedition, which was affiliated with the American Museum of Natural History, flew men and supplies by amphibious plane to lofty Lake Habbema, and from that base explored the surrounding country, including a densely populated valley on the Baliem or Balim River. This valley was named Grand Valley by the American explorers.

The conflicting early reports on Hidden Valley suggested it was distinct from Grand Valley. A recent communication from Dr. L. J. Brass, a member of the Archbold Expedition, however, stated that comparison of the Archbold aerial photographs with official Air Force photographs proves conclusively that the two are the same.

ADVENTURE SOUTH

Special Lectures—September

Three successive lectures on Latin America are to be given in the James Simpson Theatre of Chicago Natural History Museum on September 13, 14, and 15, by the well-known lecturer, Mr. Sullivan C. Richardson.

The lectures will be illustrated with kodachrome motion pictures made by Mr. Richardson on trips to Central and South America. Some of his pictures were made in 1940 on the occasion of a spectacular trip by automobile from the Great Lakes to the Straits of Magellan over the route of the Pan American Highway; others during Mr. Richardson's recent service with the Office of Inter-American Affairs.

His current lecture tour is made possible as a public service through the courtesy of the Plymouth and Dodge Divisions of the Chrysler Corporation, and the Association of American Colleges.

At the conclusion of each lecture, Mr. Richardson will conduct an open forum type of discussion for those interested in the language, history, education, and social and economic problems of Latin America.

Museum members and the general public are cordially invited to attend these free lectures. School teachers and students of Latin American affairs will find them particularly entertaining and informative. Interested persons are urged to attend all three lectures. *Reservations must be made in advance*, either by postcard or by telephone (WABash 9410). Tickets will be mailed if time permits, or held in reserve at the door until the time of the first lecture. The series is scheduled as follows:

September 13, 14, and 15

Thursday evening at 8—ADVENTURE SOUTH TO CAPE HORN.

Friday evening at 8—RUBBER RIVER

Saturday afternoon at 2—GOOD NEIGHBORS AND STRATEGIC MATERIALS

For the *evening* lectures only, entrance to Simpson Theatre must be made through the *West* Door of the Museum.

MUSEUM DISPLAYS MINERALS BASIC FOR ATOM-BOMB

By PAUL O. McGREW
ACTING CHIEF CURATOR, DEPARTMENT OF GEOLOGY

Radioactive minerals have, for many years, been of great interest to physicists, chemists and geologists. The announcement of the new atomic bomb that played such an important, if not decisive, role in terminating World War II has brought these minerals and some of their elements to public attention. Although many details are still unannounced, it is clear that a radioactive element is the major factor in the great power of the bomb.

Among the best known radioactive elements are uranium, thorium, radium and actinium. All possess the rare property of emitting rays that penetrate matter opaque to ordinary light rays. This emission of rays is a result of atomic disintegration—a change from one element into another. It is accompanied by the release of tremendous amounts of energy—presumably the source of energy for the bomb. As the parent element disintegrates, a series of new elements is produced; they are unstable. These in their turn break down into other elements until, as one end-product, lead is formed. The lead thus produced from the disintegration of radioactive elements has its own characteristic atomic weights.

For the geologist this phenomenon is important because it supplies a means of "dating" many rocks containing radioactive minerals. Experimentation has proved that the disintegration goes on at a constant known rate—a rate unaffected by temperature, pressure or other natural forces. All of the lead formed as an end-product accumulates in the parent matrix or rock. Thus by measuring the amount of lead and the amount of the radioactive element that produced it, the time since the origin of the original mineral can be determined.

This method has led to the most accurate estimates of the age in years of many of the earth's rocks and of the earth itself. Certain rocks in Russia have been found to be 1,800,000,000 years old. We know that the earth is at least older than this—exactly how much cannot be determined.

Because of the great interest in radioactive minerals as a result of the "atom bomb," a special temporary case has been installed in Stanley Field Hall. The exhibit shows many of the minerals from which radioactive elements are obtained and other pertinent information.

Placed in conspicuous places on the walls in Hall 8 are beautiful photographs of Mayan ruins. From them may be observed the conditions under which archaeologists have to work.

STORY OF WARTIME QUEST FOR QUININE IN SOUTH AMERICA—HOW MUSEUM MEN AIDED IT

By JULIAN A. STEYERMARK
ASSISTANT CURATOR OF THE HERBARIUM

When the Japanese seized the Dutch East Indies, they automatically shut off the United States' only available supply of quinine. The curious situation which existed when Pearl Harbor was attacked was that the quinine tree (*Cinchona*), like the Hevea rubber tree, although native to the New World, was better known in the Old World where it had been cultivated on a large scale for many years.

The seeds from the wild quinine trees of Bolivia, which Charles Ledger succeeded in sending to the British and Dutch, germinated and produced trees which the Dutch, by careful selection, finally got to yield bark containing as much as 18 per cent quinine. Although many East Indian seedling plants of this high-grade quinine were saved and sent to the United States at the time of Pearl Harbor, the trees were not old enough nor the supply great enough to prove of immediate use.

On Guatemalan plantations trees of a high-yielding strain from the Dutch East Indies were being harvested and yielded many hundreds of tons of bark, but these were not adequate for war purposes. The United States therefore had to get with all speed as much as possible of the highest-yielding types of wild bark in South America.

MUSEUM BOOK AIDS PROJECT

Of prime assistance was Paul C. Standley, Curator of the Herbarium at this Museum, a recognized authority on the Rubiaceae, to which family quinine belongs, by his publications of the latest classification of kinds of *Cinchona* known to exist in a wild state in Venezuela, Colombia, Ecuador, Peru, Bolivia, and Costa Rica. These treatises indicated the distinctions between the various species and furnished geographical data on localities where the different kinds of quinine trees had been found. Such detailed information furnished the various botanists, sent out by the federal government, with much needed and useful information for field work.

The writer was the first of the botanists to be sent by the United States government to Ecuador and Venezuela to study the quinine resources of those countries. The principal part of the work was to locate stands of wild quinine trees, estimate the abundance of the stand and amount of bark available, and collect and dry samples of the bark to be analyzed for the quinine content.

For this task, one had to prepare as for a Museum expedition. Not only were food, clothing, and camping equipment necessary, but also equipment for collecting and drying specimens.

In parts of the Ecuador Andes, as much as 125 to 150 inches of rain falls annually. The quinine trees are located in dense moist luxuriant forests usually at an elevation of 4,000 to 9,000 feet. They are most abundant where the slopes are steepest which necessitates one's climbing gingerly over precarious slopes of loose wet soil or mossy trunks growing near the edge of a bluff. To reach such localities it is often necessary to spend two or three days on mule trails crossing cold treeless windswept páramos at altitudes of more than 12,000 feet where snow sometimes covers up the trail of cold fog and rain obscures the surrounding country for hours at a time. The trail is often too slippery or wet to risk by mule and it is much safer to climb or descend the precipitous portions by foot.

The *Cinchona* trees usually occur in majestic virgin forest containing a large variety of trees. The undergrowth consists of palms, tree ferns, and many species of rubiaceae, melastomaceae, gesneriaceae, urticaceae, and piperaceae. A large proportion of the trunks and branches are covered with a thick growth of mosses and liverworts, often in long festoons, and a rich variety of aroids, orchids, bromeliads, peperomias, gesneriaceae, and other epiphytes cover the forest trees, including those of quinine. In order to take a sample of bark from a *Cinchona* tree, surrounding vines and epiphytes often have to be removed.

Dr. Julian A. Steyermark, Assistant Curator of the Herbarium, resumed his duties at the Museum July 1. He had been on leave since March, 1943 as botanist to explore for sources of quinine in Ecuador and Venezuela for the Foreign Economic Administration of the U. S. After his official work terminated in October, 1944, he conducted two Museum expeditions, one to the "Lost World" section of Venezuela on Ptari-tepui and Sororopan-tepui, and another, sponsored jointly by the Museum and the Venezuelan Ministry of Agriculture, to the high mountains of the coastal cordillera of eastern Venezuela.

The quinine bark is usually found to be soft and wet. The natural color of the inside bark is a pale yellow, but immediately upon removal of the bark, probably due to rapid oxidation, turns copper or rust-colored. This is a good test for recognizing whether the bark has quinine and other alkaloids in it; the false or related barks do not turn such a color.

The bark gathered is taken back to camp and dried immediately in a small oven set over a kerosene stove. The heat is so regulated that the temperature does not exceed 80 degrees centigrade, and is usually kept between 55 and 70 degrees centigrade. Drying the bark properly is of great importance. Tests carried out in chemical laboratories in the United States have shown that bark loses its quinine and other alkaloids (quinidine, cinchonine, and cinchonidine) when exposed to temperatures exceeding 80 degrees centigrade.

NATIVES' EFFICIENCY IMPROVED

The cinchona gatherers had to be advised about the most efficient means of removing the bark. Originally they were using their own machetes for bark removal, but we taught them to take off more bark much more quickly by means of a banana-knife blade attached to a pole handle. Previously, they had been accustomed to take off the larger pieces only, leaving a considerable percentage of the inner bark to rot.

For practical purposes of getting as much bark as possible, the tree is felled, leaving a stump about two or three feet high. All the bark from the trunk and from the larger branches is then cleared away and gathered. It was pointed out to the gatherers, *cascarilleros* or *quineros*, that in felling a tree a stump 2 to 3 feet high should be left intact and without injury to the remaining bark so the stump sprouts, or *retones* as they are called, may be formed the following year.

The *Cinchona* tree has a habit of sending up from near its base stump sprouts which grow in diameter and in time become normal trunks. In this manner the *Cinchona* strives to perpetuate itself, and whereas other trees may be weakened and die as the result of forest fires or the woodsman's ax, the quinine tree is able to continue its existence by new stump sprouts.

After the bark is properly dried in several areas, it is sent back to the chemical laboratories which the United States government set up in Quito, Ecuador. Here an analysis shows within a few days whether the bark collected contains a large or small percentage of total crystallizable alkaloids. In certain cases a given bark is found to contain little or no quinine but a large percentage of the other alkaloids, while in other cases there is little or no other alkaloid but quinine present. If the bark samples prove of sufficient value, the quinine areas from which they have come are marked for further exploration.

As a result of such surveys carried out by various botanists in many areas throughout the South American countries mentioned, the United States government now has a more adequate knowledge of the locations and yields of wild quinine trees in the New World. Seeds of the higher-yielding individuals are being sown and cuttings from the seedlings grafted on other stock. Plantations are being established in various South and Central American countries for insuring a future supply comparable with that of the Dutch East Indies. At least the Western Hemisphere is preparing itself against any future foreign monopoly or blockade, and has awakened from the long sleep of complacency in which it was caught at the beginning of World War II.

SATURDAY AFTERNOON LECTURES

The Museum will present its annual Autumn Lecture Course for adults on Saturday afternoons during October and November. Eight lectures on natural science and travel in far places will be given.

The lectures, most of which are accompanied by motion picture films in color, will be given in the James Simpson Theatre, and all begin at 2:30 P.M.

Following are the dates, and the subjects and lecturers booked:

October 6—OUTDOOR SYMPHONY.

Bert Harwell.

Mr. Harwell, of Berkeley, California, is western representative of the National Audubon Society. He has unusually revealing color films of bird life, and presents whistled imitations of bird songs.

October 13—BACK YARD SAFARI.

Murl Deusing.

This is a sequel to "Big Game Hunting in the Back Yard" which Mr. Deusing gave in a previous series at the Museum. Lecture and films tell the story of how he and his children found natural history excitement in exploration of their own back yard.

October 20—EXPLORING JUNGLE GARDENS WITH A COLOR CAMERA.

Mulford B. Foster.

Mr. Foster is a botanist who has penetrated lowland jungles and high mountains throughout the tropics of North and South America seeking and studying rare plants and their habits. His lecture on his adventures and discoveries is illustrated with kodachrome slides.

October 27—HAITI.

Robert Stanton.

Haiti, the Black Republic, has been called the most amazing island in the Caribbean. Mr. Stanton brings a brisk narrative of its life, and illustrates his story with motion pictures in color.

November 3—LAND OF TOMORROW—SOUTH AFRICA.

Austen West.

Mr. West was born in Natal, and his early years were spent in ranching and farming in southwest Africa. In color films he presents the scenery of his native country, and the life of the colonists as well as that of various native tribes.

November 10—BIRDS OF THE SAGE BRUSH COUNTRY.

Martin K. Bovey.

"Regulars" attending the Museum's lectures year after year remember with pleasure Mr. Bovey's several previous appearances on these programs. This new lecture is on the bird life of Alberta, Canada.

November 17—ROADS NORTH.

Karl Robinson.

Mr. Robinson, who for years has lived in Alaska, accompanies his lecture with color films covering the territory from San Francisco Bay to Fairbanks, Alaska. The traveling is done over roads built for war but destined to be the highways of peace.

November 24—VOLCANO IN ACTION.

Dr. Frederick Pough.

Dr. Pough, curator and chairman of the department of geology at the American Museum of Natural History, brings the story, in narrative and color films, of perhaps the outstanding natural history phenomenon of many centuries—the eruption of the new Mexican volcano, El Parícutin. His films show the wiping out of the town of Parícutin, the growth of vast lakes of lava, and the awesome spectacle of the volcano at night.

No tickets are necessary for admission to these lectures. A section of the Theatre is reserved for Members of the Museum, each of whom is entitled to two reserved seats. Requests for these seats should be made in advance by telephone (WABash 9410) or in writing, and seats will be held in the Member's name until 2:30 o'clock.

VISITORS TO PRESENT MUSEUM BUILDING PASS 30 MILLION

The thirty-millionth visitor to cross the threshold of the present Chicago Natural History Museum building entered the institution's portals at 1:05 P.M. July 15.

The 30,000,000th visitor to this building was also the 35,839,580th visitor in the history of the Museum, as the institution had 5,839,579 visitors during a little more than twenty-five years' occupancy of its former location in Jackson Park (the Palace of Arts of the 1893 World's Fair, now reconstructed as the Museum of Science and Industry).

Photo courtesy Chicago DAILY TIMES

VISITOR NO. 30,000,000 GREETED

Mrs. T. W. Glaze receiving book presented by the Museum from Miss Virginia Dempsey (right), Book Shop attendant, as a token marking the arrival of the 30,000,000th visitor to enter the present Museum building (and 35,839,580th in history of the Museum, both buildings). Mrs. Glaze was accompanied by her husband and two children.

When the counter in the hand of the guard clicked for No. 30,000,000, it was Mrs. T. W. Glaze, 4012 Deyo Avenue, Brookfield, Illinois, who was coming through. Miss Virginia Dempsey, North Door attendant, and Mr. George Woodward, guard, informed Mrs. Glaze that, as the thirty millionth visitor she was the guest of the Museum and entitled to come into the institution's Book Shop and select any volume she desired as a gift. She selected Malvina Hoffman's *Heads and Tales.*

The present Grant Park building was first opened to the public on May 2, 1921. Thus, in the twenty-four years of occupancy of this building, attendance has averaged 1,250,000 visitors a year, against only 233,000 a year during the twenty-five years in its former location.

Chicago Natural History Museum

FOUNDED BY MARSHALL FIELD, 1893

Roosevelt Road and Field Drive, Chicago

TELEPHONE: WABASH 9410

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Members are requested to inform the Museum promptly of changes of address.

R. MAGOON BARNES

R. Magoon Barnes, "Judge" Barnes or "R. M." to his many friends, died in Hennepin, Illinois on July 18 at the age of 83. Born April 21, 1862 in Lacon, Illinois, he spent his entire life there except for a brief trip to California in childhood with his parents. Returning to Lacon in 1864, the family resumed small town life and he attended public schools leaving them before graduating from high school to attend Northwestern University and later the law school of the Illinois Wesleyan University in Bloomington, where he finished in 1883 and received his license to practice law.

His father, whose "Barnes Law Office" dated from 1857, immediately employed him in the firm then Barnes and Muir. Later he became a member of the firm which continued with successive partnerships and at the time of his death was known as Barnes, Magoon and Barnes. At the age of 70, he retired from active practice, but never wholly relinquished the law and even in later years made numerous court appearances.

Natural history, and especially ornithology, became his hobby at an early age. During his boyhood he witnessed the great flights of passenger pigeons, now extinct, the millions of ducks and shorebirds, then a commonplace, and such present rarities as wild turkeys, trumpeter swans, and whooping cranes were familiar to him. He began to collect birds' eggs in 1876 when only 14 years old, and from then on never ceased. Later, when his means permitted, he began to augment his own collection by the purchase of other private collections from Florida to California and from California to Alaska. Thus his collection became one of the largest and finest in existence. Practically all rarities were included and others were represented by selected series.

This collection, numbering nearly 40,000 specimens, was deposited in the Chicago Natural History Museum in 1925 and in 1928 Judge Barnes was appointed to the staff of the Department of Zoology with the title of Assistant Curator of Oölogy, later changed to Curator, Birds' Eggs. At his death full title to the collection passed to the Museum.

In pursuit of his hobby and, as he said, "to rescue it from an untimely grave," he purchased the small journal known as *The Oölogist* in 1909 and continued to publish it until 1942. This publication, founded in 1875 and re-established in 1884, had served as a medium of communication among young naturalists throughout the United States and provided the inspiration for many a youth who in later life attained to distinction in the field of zoology.

During recent years Judge Barnes continued to make additions to his collection, to make frequent visits to the Museum, and to keep in touch through correspondence. His periodic appearances at the Museum were always occasions for reminiscence and jocular banter with other members of the staff with most of whom he had established warm personal relations. Cheerfulness was a characteristic and his engaging personality, his fund of humor, and his generous nature will long be remembered. In a sense, he was a link with a past that is gone, a past that but for such as he would lack its full flavor.

Staff Notes

Dr. Paul O. McGrew, Acting Chief Curator of Geology, and Mr. Bryan Patterson (at present in service with the U.S. Army) have been appointed as lecturers on the geology faculty of the University of Chicago. Their work in this capacity will be conducted concurrently with their duties at the Museum.

Dr. Rainer Zangerl, formerly Assistant Professor of Comparative Anatomy at Notre Dame, has joined the staff of the Museum as Curator of Fossil Reptiles in the Department of Geology. He is engaged in special research on fossil turtles.

Dr. Julian A. Steyermark, Assistant Curator of the Herbarium, recently returned from a government mission in Venezuela and Ecuador for the Foreign Economic Administration, has been elected to corresponding membership in the Natural Science institutes of both countries.

A promotion to the rank of Lieutenant-Commander has been won by Colin C. Sanborn, the Museum's Curator of Mammals, on leave for service with the Navy. He had been a lieutenant.

THE MUSEUM HONOR ROLL

Now in the Nation's Service

Army

DR. JOHN RINALDO, Associate, Southwestern Archaeol.—Staff Sgt.
DR. SHARAT K. ROY, Curator, Geol.—Capt.
D. DWIGHT DAVIS, Curator, Anat. and Osteol.—Corp.
BRYAN PATTERSON, Curator, Paleontology—Corp.
EMMET R. BLAKE, Asst. Curator, Birds—Special Agent, War Dept.
RUPERT L. WENZEL, Asst. Curator, Insects—Capt.
HENRY S. DYBAS, Assistant, Insects—Sgt.
WILLIAM BEECHER, Temp. Asst., Zool.—Corp.
HENRY HORBACK, Asst., Geol.—S. Sgt.
JAMES C .MCINTYRE, Guard—2nd Lt.
RAYMOND J. CONNORS, Guard—Pvt.
FRANK J. DUTKOVIC, Janitor—Pvt.

Navy

LESTER ARMOUR, Trustee—Captain
SAMUEL INSULL, JR., Trustee—Lieut. Comdr.
JOSEPH NASH FIELD, Trustee—Lieut.
COLIN CAMPBELL SANBORN, Curator, Mammals—Lieut. Comdr.
DR. ALEXANDER SPOEHR, Curator, N. Amer. Ethnol.—Lieut.
LOREN P. WOODS, Asst. Curator, Fishes—Lieut. (j.g.)
JOHN W. MOYER, Taxidermist—Ch. Specialist (Bur. Aeronautics)
JAMES H. QUINN, Chief Preparator, Paleontol.—Metalsmith 2C
PATRICK T. MCENERY, Guard—Master Gunner
NICHOLAS REPAR, Printer—Aviation Machinist's Mate 1C.
HERBERT NELSON, Painter—Painter 1C.
ELIZABETH BEST, Guide-Lecturer—Lieut. (j.g.), WAVES
MARIE B. PABST, Guide-Lecturer—Lieut. (j.g.), WAVES

Marine Corps

MELVIN A. TRAYLOR, JR. Associate, Birds—Capt.

Coast Guard

M. C. DARNALL, Jr., Guard—Lieut. (j.g.)
JOHN MCGINNIS, Guard—Ch. Boatswain's Mate

Other Services

RUDYERD BOULTON, Curator, Birds—Staff of Office of Strategic Services
BRYANT MATHER, Asst. Curator, Mineralogy—Civilian Worker, Corps of Engineers, U.S. Army
DR. C. MARTIN WILBUR, Curator, Chinese Archaeol. and Ethnol.—Staff of Office of Strategic Services

Completed War Service:

GEORGE A. RICHARDSON, Trustee—Lt. Col., U.S.A.
CLIFFORD C. GREGG, Director—Colonel, G.S.C., U.S.A.
JOHN SYCKOWSKI, Guard—Ch. Commissary Stewd., U.S. Navy
MORRIS JOHNSON, Carpenter—Carpenter's Mate 1C., U.S.N.R.
LLEWELYN WILLIAMS, Curator of Economic Botany—special service for U.S. Government
DR. JULIAN A. STEYERMARK, Asst. Curator, Herbarium—field work for Foreign Ecooomic Administration

Died in Service:

THEODORE ROOSEVELT, Trustee—Brig. Gen., U.S.A.
GEORGE JAHRAND, Guard—Ch. Machinist, U.S.N.

REPORT ON WAR DAMAGE TO IMPORTANT MUSEUMS

Both before and since V-E Day, trickles of information have reached the Chicago Natural History Museum from various sources relating to damages suffered by important natural history collections in museums of Europe and the Orient.

From reports thus far received, the most complete destruction was that suffered in air raids by the Botanical Museum in Dahlem, a suburb of Berlin. This famous building and its collections, together with its large library, were reported completely destroyed either by direct hit or by ensuing fire and water. Only material stored in basement shelters is said to have been saved, including specimens on loan from other botanical institutions, some of them belonging to this Museum.

Responsibility for the Germans' own loss has been laid directly at the door of the Nazis' second-in-command, Hermann Goering, who is said to have assured the German botanists that they need evacuate nothing from there, and that no precautions were necessary, because, he said, "Berlin never will be bombed."

CHICAGO MUSEUM RECORDS 'TYPES'

Fortunately for botanical science the Chicago Natural History Museum, by means of its ten-year botanical project in Europe prior to the war, obtained photographs of most of the type specimens not only in the herbarium of Berlin, but also in Copenhagen, Munich, Vienna, Paris, Geneva, Madrid, and elsewhere—more than 40,000 photographs.

From Dr. Frans Verdoorn, a number of notes on other institutions have been received by this Museum. Dr. Verdoorn is managing editor of the scientific journal, *Chronica Botanica*, published at Waltham, Massachusetts, and the notes received from him are the basis of a more extensive article published in that periodical (Vol. 8, No. 5/6).

The collections of all departments of the Paris Natural History Museum are reported to have survived intact. At Caen, France, the Botanical Garden and Museum —a very famous one—are reported to have been completely destroyed.

In Belgium, according to word received from Dr. George Sarton, much of the grounds, but not the collections of the museum, of the Jardin Botanique has been completely destroyed.

BRITISH MUSEUM HARD HIT

Extensive and detailed accounts of losses incurred by the zoology department of the South Kensington Museum in London (Natural History Division of the British Museum) have been received.

The *Gardeners' Chronicle* (British) reported that incendiary and high explosive bombs fell on the premises, causing serious fires in both the Shell Gallery and the general herbarium.

Science said: "Information received from London indicates the most serious damage was caused by an incendiary bomb which fell on the roof of the east wing and penetrated to the foreign herbarium of the botanical department. A large number of plant specimens were destroyed, and many thousands of herbarium sheets were badly damaged by fire and water. It is understood that the Department of Entomology was also damaged."

From Leningrad in the U.S.S.R. comes word that the large and important herbarium and library at the Kamarov Institute of Botany (Principal Botanical Garden) suffered no damage during the siege of Leningrad although bombs fell on the site.

The Karkov Herbarium, the Ukrainian Academy of Science at Kiev, and the Nikita Botanical Garden near Yalta in the Crimea were confiscated by the Nazi invaders and moved to Germany. No doubt the Russians now have recovered them.

From *Science* the following information on German museums, reported by Dr. John W. Wells, of the department of geology of Ohio State University, has been obtained:

Jena: Mineralogisches Institut totally demolished and apparently not wholly evacuated before the main bombing three weeks before the capture of the city. Geographisches Anstalt somewhat damaged.

Heidelberg: Undamaged, but most of collections of the Geologisches-Paläontologisches Institut evacuated.

Wurzburg: Geographisches Institut completely demolished, but most of equipment apparently moved to the country.

Darmstadt: Geologisches Institut and Hessisches Geologisches Landesanstalt totally demolished.

Frankfurt a/M.: Geologisches Institut of Goethe Universität wholly demolished. Senckenberg Museum in very bad shape, reduced almost to a hollow shell, but research collections and library are safe.

Bonn: Geographisches Institut a total loss, but material mostly evacuated across the Rhine.

Cologne: Geographisches Institut in bad shape, not evacuated.

Munich: Geographisches Institut relatively undamaged.

Bayerische Akademie building is a total wreck, and of the vast geological, paleontological and mineralogical collections, only about 250 cases, a very small part, were saved. All the fossil vertebrate collections were destroyed. The building of the Geographisches Gesellschaft was wholly destroyed and the entire library lost. Preussische Geologische Landesanstalt and Museum für Naturkunde are destroyed.

From correspondents in Europe, Mr. Karl P. Schmidt, Chief Curator of the Department of Zoology at this museum, has learned that the buildings and contents of the natural history museum in Leyden, The Netherlands, and the entomological museum in Naples, Italy, survived intact.

Reports reaching Dr. E. D. Merrill from the Orient indicate that the Bureau of Science in Manila, with its immense collections in botany and zoology as well as its outstanding library, the results of almost half a century of strenuous work by American scientists, were completely destroyed.

All collections of the Fan Memorial Institute of Peiping (Peking) were stolen by the Japs and removed to Tokyo. Likewise, the collections of the Sun Yat Sen University Herbarium were looted by the Nipponese and shipped to Taihoku in Formosa, according to Dr. Merrill.

LAYMAN LECTURES ON SUNDAYS TO OPEN IN OCTOBER

The 1945–46 season of Sunday afternoon lectures by Mr. Paul G. Dallwig, Layman Lecturer of the Museum, will be extended to seven months instead of the usual six, and will include a new subject not hitherto presented, as well as a resumption of titles which have proved popular in the past and are presented again to fulfill many requests. In the lectures on the repeated subjects, Mr. Dallwig has interpolated much new material, and the revised lectures will therefore be in effect new ones.

PAUL G. DALLWIG

Mr. Dallwig will lecture every Sunday afternoon from the beginning of October until the end of January; in February his appearances will be suspended while he makes a lecture tour of eastern cities; he will then again lecture at the Museum in March, April and May.

The starting time of the lectures this season has been changed to 2:30 P.M. instead of 3 P.M., the starting time in effect last season.

The season's first lecture, to be given on October 7, 14, 21 and 28, is "The Amazing Story of Our American Forests." In this lecture Mr. Dallwig will cover the history of forestry.

Mr. Dallwig's schedule for the rest of the autumn is as follows: Sundays in November, "The Romance of Wood"; December, "Parade of the Races in Bronze."

The heavy demand by the public for Mr. Dallwig's lectures, and the necessity of limiting the size of each audience make it necessary to require advance reservations. Lectures are necessarily restricted to adults. Reservations will be accepted by mail or telephone (WABash 9410).

SATURDAY CHILDREN'S PROGRAMS —RAYMOND FOUNDATION

The James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures will present its autumn series of free motion picture programs for children on Saturday mornings during October and November. These programs, to which children from all parts of Chicago and suburbs are invited, will be presented twice each Saturday, at 10 A.M. and at 11, in the James Simpson Theatre of the Museum.

Following is the schedule:

October 6—INDIANS TODAY.
Also a cartoon.

October 13—THIS AMAZING AMERICA.
Also a cartoon.

October 20—REALM OF THE WILD.
Also a cartoon.

October 27—*Title to be announced.*

November 3—MAGIC FROM THE EARTH.
The story of coal and oil.
Also a cartoon.

November 10—ALONG THE MISSISSIPPI.
Also a cartoon.

November 17—CHIMPANZEE CIRCUS.
Mr. Leon Smith, trainer of the chimps in the St. Louis Zoo, will explain the pictures. He will be accompanied by his dog Suki.

November 24—ALL-CARTOON PROGRAM.

LECTURE TOURS ON WEEKDAYS, SEPTEMBER AND OCTOBER

Conducted tours of exhibits, under the guidance of staff lecturers, are made every afternoon at 2 o'clock, except Sundays and certain holidays. On Mondays, Tuesdays, Thursdays, and Saturdays, general tours are given, covering all departments. Special subjects are offered on Wednesdays and Fridays; a schedule of these follows:

September

Wed., Sept. 5—Heads and Tales— The Malvina Hoffman Bronzes (*Mrs. Roberta Cramer*).

Fri., Sept. 7—Meet the People—Our Neighbors Around the World (*Emma Neve*).

Wed., Sept. 12—Our Daily Bread—Plants of Economic Importance (*Mrs. Roberta Cramer*).

Fri., Sept. 14—Prehistoric America (*Emma Neve*).

Wed., Sept. 19—The Ancient Magic of Jade (*Mrs. Roberta Cramer*).

Fri., Sept. 21—People of the Pyramids (*Emma Neve*).

Wed., Sept. 26—Before the Dawn of Man—Prehistoric Plants and Animals (*Mrs. Roberta Cramer*).

Fri., Sept. 28—The Story of Furs—Fur-bearing Animals (*Miriam Wood*).

October

Wed., Oct. 3—Oriental Weavers (*Mrs. Roberta Cramer*).

Fri., Oct. 5—Color Changes in Nature—Leaves, Birds, Fish, Mammals and Reptiles (*Miriam Wood*).

Wed., Oct. 10—Double Ten, the New China (*Emma Neve*).

Fri., Oct. 12—Along the Ancient Routes of Silks, Spices and Gold (*Mrs. Roberta Cramer*).

Wed., Oct. 17—Whales—The Largest Mammals in the World (*Miriam Wood*).

Fri., Oct. 19—Past and Present in Africa (*Emma Neve*).

Wed., Oct. 24—Ghost Stories—Masks and Magic (*Mrs. Roberta Cramer*).

Fri., Oct. 26—The Largest and Smallest Animals (*Miriam Wood*).

Wed., Oct. 31—Stone Age Europe (*Emma Neve*).

GIFTS TO THE MUSEUM

Following is a list of some of the principal gifts received during the last two months:

Department of Anthropology

From: T. L. J. Klapp, Jr., Chicago—a Sac and Fox buffalo robe, Illinois.

Department of Botany

From: The Griffith Laboratories, Chicago, 28 samples of spices; T/5 Louis B. Martin, U. S. Army—44 cryptogams, New Guinea; Dr. G. W. Prescott, Cheboygan, Mich.—78 specimens of algae, Panama and Canal Zone; Dr. Alton A. Lindsey, Albuquerque, N. M.—20 specimens of algae, New Mexico; Robert Runyon, Brownsville, Tex.—43 cryptogams, Texas; Dr. Delzie Demaree, Monticello, Ark.—82 specimens of algae, Arkansas; Dr. Paul D. Voth, Chicago—89 specimens of algae, Illinois; Funk Bros. Seed Company, Bloomington, Ill.—18 specimens of inbred and hybrid corn; Prof. J. Soukup, Lima, Peru—64 herbarium specimens, Peru; Escuela Agrícola Panamericana, Tegucigalpa, Honduras—800 herbarium specimens, Honduras; W. A. Toole, Baraboo, Wis.—23 pot herbs and medicinal plants.

Department of Geology

From: Edwin C. Galbreath, Springfield, Ill.—femur of *Canis latrans*, Illinois gravel pits; Dr. M. J. Groesbeck, Porterville, Calif.—a specimen of chalcedony after stilbite and one of porphyritic diorite, California; Miss Ann Zay, Oak Park, Ill.—5 geological specimens; C. N. Bruegger, Chicago—a specimen of native copper, Wisconsin.

Department of Zoology

From: the late R. M. Barnes, Lacon, Ill.—collection of 39,317 North American birds' eggs in 24 cases; Boardman Conover, Chicago—27 game birds; Chicago Zoological Society, Brookfield, Ill.—a rattlesnake, an armadillo, 2 mamba heads, 2 baby swans, and 13 other birds; Lincoln Park Zoo, Chicago—an infant guanaco and 2 bird skins; Lieut. Comdr. Colin C. Sanborn, U.S.N.R.—4 bird skins and 13 fish, Peru and Hawaii; T/5 W. J. Beecher, U. S. Army—2 centipedes, Guadalcanal; Lt. Harry Hoogstraal, U. S. Army—14 fish, 6 bats, a mouse, 2 bandicoot embryos, and 19 specimens of worms and crustacea, Australia and New Guinea; J. D. Bangston, Mason, Tex.—a ring-tailed civet cat, Texas; Capt. Robert Traub, U. S. Army—23 snakes, lizards, and frogs, India; University of Chicago, Chicago—2 guinea pigs; Miss Frances Poe, Wilmette, Ill.—an infant opossum, Illinois; Lieut. Loren P. Woods, U. S. Navy—9 snakes, frogs, and lizards, California; Lt. and Mrs. Frederick Greeley, Winnetka, Ill.—2 snakes, Texas and Wisconsin; Corp. Bryan Patterson, U. S. Army—122 freshwater shells, Illinois; Walter F. Webb, Rochester, N. Y.—an egg mass of a marine snail, Florida; Capt. Carl Mohr, U. S. Army—8 bats, Philippine Islands; Dr. J. L. B. Smith, Grahamstown, Union of South Africa—a scale of living coelacanth; A. Kapturski, Chicago—a domestic pigeon; Shemroske Bros., Chicago—a domestic pigeon; Roger Conant, Philadelphia, Pa.—27 specimens of turtles from 6 species; Ens. John F. Kurfess, Milwaukee, Wis.—30 snakes, lizards, and frogs, Illinois and Admiralty Islands; Dr. Clarence R. Smith, Aurora, Ill.—a snapping turtle and a soft-shelled turtle, Illinois; Lt. H. R. Mead, U. S. Army—8 fish specimens, Africa.

Library:

From: Lieut. Comdr. Colin C. Sanborn, U.S.N.R.; Paul H. Baldwin, Honolulu, Hawaii; Thomas A. Edison, Inc., West Orange, N. J.; P. W. Fattig, Emory University, Georgia; B. F. Goodrich Company, Akron, Ohio; William M. Harlow, Syracuse, N. Y.; Armando Hunziger, T., Buenos Aires, Argentina; Rui Simões Menzes, Portuleza, Ceára, Brazil; F. Nabil, Secretary, General Iranian Delegation, San Francisco, Calif.; Albert E. Parr, New York City; Raymond Rogers, Wilmington, Calif.; South Bend Lathe Works, South Bend, Ind.; R. E. Woodruff, Cleveland, Ohio; and Dr. A. A. Dahlberg, Col. Clifford C. Gregg, Dr. Fritz Haas, John Crerar Library, Mrs. Frank J. Psota, and Westinghouse Electric Supply Company, all of Chicago.

Annual Report Published

By the time this issue of the BULLETIN is mailed, distribution of the Annual Report of the Director for 1944 to members will either be completed or on the verge of completion. The publication was delayed due to man shortage in the Museum's Division of Printing, and the accumulation of a backlog of publications exceeding the capacity of the Museum Press. The report is the last to be made by Mr. Orr Goodson, Acting Director, who recently accepted a position elsewhere prior to the return to the directorship of Colonel Clifford C. Gregg, absent for several years on Army service.

Regent of Iraq Visits Museum

Price Abdul Ilah, Regent of Iraq, during a recent sojourn in Chicago spent several hours in a visit to the Museum. Director Clifford C. Gregg acted as host.

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DOMESTIC PIGEONS, DARWIN'S AIDS IN RESEARCH ON THE ORIGIN OF SPECIES

By KARL P. SCHMIDT
CHIEF CURATOR, DEPARTMENT OF ZOOLOGY

The domestic pigeon, so familiar even to city dwellers from the feral* flocks that roost and nest on bridges and on ledges of high buildings, supplies the attractive material of a panel recently installed in the Museum's systematic collection of birds in Hall 21.

RED ENGLISH POUTER

Like the fantails, the pouters represent an exaggeration of the normal courtship poses; both structure and behavior have been subject to man's selection.

This panel presents two topics of special interest to natural history: *The Origin of the Domestic Pigeon* and the general subject of *Artificial Selection*. It thus continues the program of installing cases bearing upon general principles to supplement and give meaning to the conspectus of the Animal Kingdom that forms, for the Department of Zoology, the Museum's primary contribution to public education.

ILLUSTRATION OF PRINCIPLES

While the primary exhibition collections require much expansion and improvement, the treatment of principles and ideas in the exhibition halls needs thought and experiment in our continuing program.

Although the ancestry of some domestic animals and plants is obscure, even in the light of archaeology and paleontology, this is not the case with the pigeon. The progenitor of all of the domestic breeds and sub-breeds is plainly the rock pigeon of southern Europe and southwestern Asia.

This is a handsome bluish bird, very much like the modern homer in appearance, with a pair of black bars across each wing. It is remarkable that the crossing of the most strikingly different domesticated breeds produces a reversion to the original type, and such "wild pigeon" replicas are common among the mongrel flocks in city parks. The domestication of the rock pigeon apparently took place in Asia.

ON MENU IN 3000 B.C.

The earliest known mention of the pigeon as a domestic animal appears to be in the menu of an Egyptian pharaoh of about 3000 B.C. Since that time, pigeons have continued to be valued as food, but apparently even more for their interest to fanciers. More than 120 main breeds are recorded as the result of this avocation, and these include a great number of subordinate

FANTAIL

The fantail has the number of tail feathers increased from the normal 12 to 30 or even 40.

races, some of them very recently produced. Pigeon fanciers continue to be enthusiastic breeders and showmen, and this fact was impressed upon the Museum by the gift of prize-winning birds for its exhibition project, partly from members of the Chicago Pigeon Club, and partly from breeders in various other parts of the United States.

ARTIFICIAL SELECTION

One of the remarkable races of domestic pigeons is the giant runt, the largest of the breeds and naturally a favorite for squab

BALDHEAD TUMBLER

The baldhead is one of the great number of varieties of tumblers, remarkable for their curious "tumbling" maneuverings while in flight.

production. Exaggerations of the normal courtship display are shown in the pouters, the jacobins, and the fantails. The tumblers are bred for erratic behavior in flight. The homers, with their powers of flight and homing ability, replace the older carrier breed. The carrier, with its curious wattles, has become one of the most bizarre of the "ornamentals." The extremes to which "fancy" breeding may be carried are shown in the owls, the smallest of the races. These have the bill so extremely shortened that the parents are unable to feed their own young, and the breed has to be maintained by the use of foster parents. All of these types can be bred for special varieties of coloration.

The idea of *artificial selection*, i.e., the rule-of-thumb breeding method by which

* The useful word "feral" refers to domestic animals that have returned to wild life, as cats and pigeons familiarly do and as almost all domestic animals do under favoring circumstances.

CROWNED PIGEON

Included in the panel of wild pigeons, this is the largest living member of the order, growing to the size of a large domestic fowl. It is found only in the New Guinea area where the Museum specimen was collected in 1928 by the Cornelius Crane Pacific Expedition.

man has produced this remarkable variety of form and coloration, is the natural counterpart of the profoundly important principle of *natural selection*. This was proposed by Darwin in the epoch-making *Origin of Species*. The publication of this work in 1859 was a turning point in the history of biology, and indeed, in human thought. It is no exaggeration to state that this was the most important historic event in the 19th century.

It is simple and romantic to find the beginnings of the idea of evolution in the mind of Charles Darwin in his first glimpse of the fossils of gigantic extinct creatures in the cliffs of Patagonia or in his contact with the animal life of the "Lost World" of the Galapagos. Actually, the thinking that resulted in the *Origin of Species* in 1859 had a multitude of roots, and not the least interesting found natural soil in the life of a country gentleman, with its intimate contact with domestic animals. Animals under domestication, removed from the pressures of the "struggle for existence" (it is difficult to think of such matters in pre-Darwinian terms), exhibit an extraordinary variability. By both conscious and unconscious selection, man has seized upon this variability to produce useful breeds or to increase the usefulness to himself of existing ones.

After his return from the voyage of the *Beagle*, Darwin settled at Down and addressed himself to the methodical testing of the evidences for evolution. As a naturalist, he was more interested in the diversification of plant and animal life into the multitude of existing types, i.e., in the *origin of species*, than in any hypothetical progression from simple to complex or from amoeba to man. The multitude of English breeds of domestic animals was of course familiar to him, and much of their origin was common knowledge to every intelligent farmer.

A report on the phenomena of domestication took shape for his growing book, and in order to speak with authority, he undertook extensive breeding of pigeons in his own lofts, joining the London clubs of pigeon breeders and fanciers, and corresponding extensively with other breeders.

Darwin's studies did not disclose the secrets of heredity discovered by his contemporary, Gregor Mendel; but his knowledge of the variability of his pigeons and of the impact on that variability of selection by man made his account of animals and plants under domestication, the first chapter in the *Origin of Species*, an admirable and logical introduction to the whole topic of evolution. Darwin's first expansion of the material in the *Origin* resulted in his *Animals and Plants under Domestication*.

ARTIFICIAL SELECTION SECTION OF THE NEW PIGEON EXHIBIT

The breeds and varieties of the domestic pigeon exhibit the effects of artificial selection on a single species. The ancestral rock pigeon is shown at the top of the screen.

NATURAL SELECTION

As a counterpart for the illustration of artificial selection by domestic pigeons, the principal types of wild pigeons have been assembled in a special case labeled "Results of Natural Selection in Wild Pigeons." Such results are, of course, represented by the whole of the animal and plant kingdoms. The wild pigeons include extremes in size, from the New Guinea crowned pigeon, as large as an Orpington chicken, to the tiny ground doves, no more than six inches long; and extremes of coloration, from the dull-colored desert types to the brilliantly colored fruit pigeons of the tropics.

In all their diversity, wild pigeons ordinarily do not exhibit the bizarre extremes of the domestic races. Natural selection eliminates such extremes. The case of the dodo, which evolved into a gigantic, flightless, and helpless creature in the safety of a remote island, affords an example of evolution under release from the principal forces of natural selection.

The diversity of type in the pigeon tribe in general represents a capitalization upon a striking adaptation, the production of a special food for the young, the so-called "pigeon milk." It is this advantage that has enabled the pigeons (in this case the Order Columbiformes) to range over most of the world and into every kind of environment, with the accompanying evolution of some sixty genera, including the distinct suborder for the "sand grouse," the family Raphidae for the dodo, and four subfamilies of the true pigeons (the family Columbidae).

The preparation of the two pigeon screens has been accomplished by gratifying co-operation. The mounting of the birds is by Staff Taxidermists Wilmer E. Eigsti, Frank C. Wonder, and John W. Moyer, while bills and feet in celluloid were produced by Leon L. Walters. The assemblage of the specimens of domestic pigeons was undertaken by Mr. Joseph N. Koehler, with the aid of Mr. Walter Krawiec, and all came to the Museum without cost. Valued advice was also received from Messrs. Frank Mack and Karl Plath.

The breeders and donors of pigeons are:

Lewis W. Bell, Oak Park—black nun; Robert R. Boehland, Rockford—red jacobin and kite saddle fantail; H. Eric Buri, Birmingham, New Jersey—white giant runt; Sid Buzennius, Berwyn—blue laced satinette; Walter O. Grant, Chicago—blue barred spot swallow; Groh Brothers, Chicago—yellow African owl; A. Kapturski, Chicago—red English pouter; Joseph N. Koehler, Chicago—black baldhead; Charles Strebling, Lyons, Illinois—black English carrier, and Shemroske Brothers, Chicago—flying homer.

PARASITISM BY MISTLETOES CREATES 'WOOD-FLOWERS'

Among the botanical objects recently received by the Museum from the Department of Botany of Northwestern University is an unusual specimen of what is commonly called a "wood-flower." This is a bizarre flower-like formation of the wood of a branch of a hardwood tree, and marks the place of former attachment of a mistletoe plant which in this case must have been of enormous size.

The whole extravagant wood structure, which measures sixteen inches in length and twelve inches in diameter, is the empty socket in which the parasitic plant was once fastened, and represents the response of the tree to the prolonged presence and great increase in size of its incubus. The thin bark which once covered the external surface of the structure has disappeared; the complicated inner surface with its radiating ridges and grooves is virtually a huge scar left by the death and removal of the parasite.

The wood of the branch is that of an Inga, a common tropical leguminous tree frequently planted for shade on coffee plantations, especially in Central America where trees are often infested by a tropical mistletoe, *Psittacanthus*. This is a rather broad-leaved parasitic shrub with showy red flowers, and is well known for causing the production of so-called "wood-flowers" on branches of the trees unfortunate enough to serve as host.

The specimen on exhibition, together with a reproduction of a branch of *Psittacanthus*, is found in the case devoted to the mistletoe family in the plant life exhibits in Martin A. and Carrie Ryerson Hall (Hall 29). Various other very different forms of mistletoe hold-fasts also are to be seen there, as well as the North American mistletoe commonly used as a Christmas decoration. In connection with this, it may be pointed out that Botanical Leaflet No. 24 treats of mistletoe and holly.* —B.E.D.

SATURDAY CHILDREN'S PROGRAMS —RAYMOND FOUNDATION

The James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures will continue its autumn series of free motion picture programs for children on Saturday mornings during November. These programs, to which children from all parts of Chicago and suburbs are invited, will be presented twice each Saturday, at 10 A.M. and at 11, in the James Simpson Theatre of the Museum.

Following is the schedule:

November 3—MAGIC FROM THE EARTH.
The story of coal and oil.
Also a cartoon.

November 10—ALONG THE MISSISSIPPI.
Also a cartoon.

November 17—CHIMPANZEE CIRCUS.
Mr. Leon Smith, trainer of the chimps in the St. Louis Zoo, will explain the pictures. He will be accompanied by his dog Suki.

November 24—ALL-CARTOON PROGRAM.

*Chicago Natural History Museum Press—25 cents.

SATURDAY AFTERNOON LECTURES

The Museum will continue its annual Autumn Lecture Course for adults on Saturday afternoons during November. Four lectures on natural science and travel in far places will be given.

The lectures, most of which are accompanied by motion picture films in color, will be given in the James Simpson Theatre, and all begin at 2:30 P.M.

No tickets are necessary for admission to these lectures. A section of the Theatre is reserved for Members of the Museum, each of whom is entitled to two reserved seats. Requests for these seats should be made in advance by telephone (WABash 9410) or in writing, and seats will be held in the Member's name until 2:30 o'clock.

Following are the dates, and the subjects and lecturers booked:

November 3—LAND OF TOMORROW—SOUTH AFRICA.
Austen West.

November 10—BIRDS OF THE SAGE BRUSH COUNTRY.
Martin K. Bovey.

November 17—ROADS NORTH.
Karl Robinson.

November 24—VOLCANO IN ACTION.
Dr. Frederick Pough.

The concluding lecture, by Dr. Pough of the American Museum of Natural History, is an outstanding feature of the course, presenting in natural color motion pictures the story of the new Mexican volcano, El Parícutin, which is probably the most notable natural history phenomenon in many centuries.

Not What They Seem

Things are not always what they seem—a case in Frederick J. V. Skiff Hall (Hall 37), is filled with what appear to be ordinary stalagmites, stalactites and incrustations from cave deposits. They are really rich lead and zinc ores formed in the same way as cave deposits.

Crucibles, flasks, and other utensils blown from quartz are used in chemical laboratories to fit conditions no glass can endure.

LAYMAN LECTURES ON SUNDAYS, NOVEMBER AND DECEMBER

Sunday afternoon lectures by Paul G. Dallwig, the Layman Lecturer, in November will be on "The Romance of Wood"; in December his subject will be "The Parade of the Races in Bronze."

In the first of these, to be presented on November 4, 11, 18 and 25, Mr. Dallwig will explain the difference between hardwood and softwood; tell how mahogany, walnut and other fine woods are imitated—and how imitations may be detected. He will survey the early and present uses of wood, and trace the development of laminated construction, plywoods and veneers as employed by the most famous custom designers of furniture of the present and earlier eras. He will also explain new scientific discoveries based on the chemistry of wood making it possible to mold it like clay, yet make it as hard as steel. From this, he will go into the processes of turning "wood wastes" into alcohol, plastics, and other commercial products.

MANGBETU WOMAN
"RACES IN BRONZE"
(December lecture)

In December (Sundays the 2nd, 9th, 16th, 23rd and 30th) Mr. Dallwig will present a revised and up-to-date version of one of the subjects which has proved most popular in his past seasons, based upon the Races of Mankind sculptures by Malvina Hoffman. In effect, the lecture is an introduction to all the principal peoples of the world—both those who live in jungle and other primitive conditions, and those in the countries where civilization has been developed to the highest degree.

A MUSEUM WOOD
MONOGRAPH
(November lecture)

The starting time of the lectures this season has been changed to 2:30 P.M. instead of 3 P.M., the starting time in effect last season.

The heavy demand by the public for Mr. Dallwig's lectures, and the necessity of limiting the size of each audience make it necessary to require advance reservations. Lectures are necessarily restricted to adults. Reservations will be accepted by mail or telephone (WABash 9410).

YOPO, AN INDIAN NARCOTIC OF SOUTH AMERICA

By LLEWELYN WILLIAMS
CURATOR OF ECONOMIC BOTANY

The use of narcotic plants or stimulants, for the purpose of exhilaration, intoxication or in tribal ceremonies, has been practised since ancient times. Plants of this class are many, and the methods of using them are likewise varied, some being employed for smoking, chewing or as a snuff, while others are prepared into beverages or infusions. Unquestionably the best known is the almost universal tobacco, in use over the greater part of this continent before the advent of Columbus.

Among others may be mentioned dried coca leaves, the source of the drug cocaine, esteemed for chewing since remote times by the inhabitants of the Andean highlands and the west coast of South America; "yerba maté" or Paraguay tea, and its close ally, "cassine," of our southeastern states; the "guaraná" of northern Brazil; and "caapi" or "ayahuasca," a woody vine whose leaves are boiled down to furnish a potent infusion popular among some of the Indians of the Peruvian Amazon, and described in *Field Museum News* of March, 1939.

REPORTED ON COLUMBUS' VOYAGE

One of the most unusual instances of the use made by natives of a plant possessing narcotic or stimulating properties is that of the seeds of the "cojoba" (*Piptadenia peregrina*), a tree of the bean family growing spontaneously along the banks of the Orinoco and Amazon rivers and their tributaries, also in some of the Antilles. The use of this narcotic was first recorded in 1493 by Las Casas, the chronicler of the second voyage of Columbus. Upon their arrival in Hispaniola, the island now comprising the republics of Haiti and Santo Domingo, Columbus and his companions discovered that the natives used a snuff, inhaled through the nostrils by means of a bifurcated tube. The snuff was called "cohoba" in the language of the islanders.

Narratives of travelers in South America, such as Father Gumilla (1741), La Condamine (1745), Humboldt and Bonpland (1819), and Spruce (1850), likewise describe the use among savage tribes of this ceremonial snuff, taken by means of a forked tube. The custom may well have been spread by the Caribs, since in all cases the narcotic was prepared from the seeds of *Piptadenia peregrina*, the tree called "cojoba" in Haiti and Venezuela.

All the writers united in declaring that it induced a kind of intoxication, accompanied by visions regarded by the natives as supernatural. While under its influence the priests or necromancers, according to Safford (*Journ. Wash. Acad. Sci.*, vol. 6), "were supposed to hold communications with unseen powers, and their incoherent mutterings were regarded as prophecies or revelations of hidden things. In treating the sick the physicians made use of it to discover the cause of the malady or the person or spirit by whom the patient was bewitched."

STILL USED TODAY

While on the Chicago Natural History Museum-Venezuelan Government botanical expedition to the Upper Orinoco in 1942, the writer had occasion to spend more than a week with a group of Piaroa Indians, in the delta of the Ventuari. During this stay it was observed that these Indians were still addicted to the use of a snuff prepared from seeds of the identical tree, and employ the same type of apparatus as that described by Columbus' chronicler and travelers in other regions of South America.

In certain areas of the Upper Orinoco the cojoba tree, also called "yopo" or "niopo," is a common element of the savannas, or open grasslands. It is small to medium-sized, with very rough bark, and its leaves resemble a mimosa or acacia. Its minute white flowers are borne in clusters on a long slender stalk, and its fruit is a leathery pod, rough on the outside, with flat orbicular seeds, green at first, turning black and glossy when ripe.

During the dry months of January and February, hordes of Guahibo and Piaroa Indians roam over the savannas, especially around the famed rapids of Atures and Maypures, in search of the long pods. The seeds are removed, moistened, ground into a fine paste and finally roasted.

HOW IT'S TAKEN

For taking the snuff, part of the paraphernalia consists of a Y-shaped apparatus suggesting a tuning fork, made of the leg bones of herons or other long-shanked birds. The two upper tubes are joined together with a thread and this is covered over with a pitch-like resin of the "peramán" tree (*Symphonia*). The ends are tipped with perforated knobs, usually palm fruit. When not in use, a pair of stiff trimmed feathers, joined with a crossbar, is inserted in the tubes, to keep them clean.

When desired, a small quantity of yopo is placed on a wooden dish, and broken up into a fine powder which is cinnamon brown in color. The Piaroa holds the dish in his right hand, and inserts the knobs of the tubes in his nostrils while he constantly moves the lower end of the tube over the dish, at the same time forcibly inhaling the powder. The entire operation is completed in less than a minute. So stimulating is its effect that a small portion of yopo will produce violent sneezing, even among those long accustomed to its use. The eyes become blood-shot, and a type of hypnotic state endures for a few minutes, followed by a soothing influence which lasts longer.

Although the tree is widespread in South America, and its seeds have long been known to travelers and botanists as highly narcotic, as far as we know yopo has not been studied chemically, and the exact source of its narcotic properties is a mystery.

THE MUSEUM WILL CLOSE CHRISTMAS AND NEW YEAR'S DAY in order to permit as many employees as possible to spend the holidays with their families.

NEW HOPEWELL SCULPTURE DISPLAY IN HALL B

By GEORGE QUIMBY
CURATOR OF EXHIBITS (ANTHROPOLOGY)

Hopewell sculpture is the subject of a new exhibit recently installed in Hall B (American Archaeology). The Hopewell Indians, who lived in Ohio from perhaps A.D. 1100 to 1400, were the best sculptors in eastern North America. From such materials as bone, antler, fossil ivory, cannel coal, stone, and wood they made beautiful carvings. These Indians also made excellent figurines of pottery and in some instances of virgin copper beaten and annealed.

The sculpture shown in the new exhibit consists entirely of carved objects. There are representations of humans, animals, birds, amphibians, and fish. In some figures the eyes are depicted by fresh-water pearls set into the carving. All of the sculptures exhibited are outstanding as fine examples of Hopewell art.

All of the sculptures are small. Because of this, it seemed necessary to exhibit the carvings in such a way that attention would be sharply focused upon their aesthetic and technical qualities. We know, for instance, that when previously exhibited these sculptures were missed by many visitors, who, although they observed the exhibit failed to see the individual carvings. The sculptures actually were lost in the exhibit.

The new exhibit overcomes the defects of previous installations. All of the sculptures are shown in four brightly lighted niches with colored backgrounds. By virtue of size, form, and color the niches contrast markedly with the surrounding expanse of wall, and serve to attract attention. Closer observation, however, focuses the observer's scrutiny upon individual niches in any order he wishes to follow. And within each niche the individual sculptures, well illuminated, stand out against the background color, which is selected to bring out the best qualities of the exhibited specimens.

The exhibit was designed by Artist Gustav Dalstrom, Chief Curator Paul S. Martin, Curator Donald Collier, and the writer.

REGALECUS, LAMPRIS, MOLA AND RANZANIA—FOUR OF THE STRANGEST FISHES TO BE FOUND IN THE SEA

By MARION GREY
ASSOCIATE, DIVISION OF FISHES

Models of four of the strangest fishes to be found in the sea have recently been installed in the systematic cases along the north wall of the Hall of Fishes (Hall O). Only one of them, indeed, is familiar even to the professional fishermen of the seacoast. It is the ocean sunfish (no relative of the fresh-water sunfishes). So remarkable are these creatures, however, that the names:—

Regalecus, the oar fish;
Lampris, the moonfish;
Mola, the sunfish;
Ranzania, the truncated sunfish—

are familar to all zoologists who study salt-water fishes.

One of the newly installed forms, the oar fish (*Regalecus glesne*), has sometimes been mistaken for a "sea serpent." It nicely fits the description, albeit imaginative, of a monster with a horse's head and flaming mane. The thin silvery ribbon-like body, almost as flat as a pancake, has been known to reach a length of 50 feet, ample size for a monster, while the illusion is completed by a crest consisting of the first rays of the long crimson dorsal fin. It may weigh as much as 600 pounds.

OAR FISH RARELY SEEN

The oar fish, also called ribbonfish, is probably an inhabitant of the upper parts of the dark waters of the oceans. Its depth range is entirely unknown since the fish has never been caught on lines, or in dredges or deep-sea nets. Besides the one or two instances of observation of the living animal, our "sea serpent" is known only from dead specimens found washed ashore, usually following a storm.

However, a certain amount of surmise is possible. The middle depths of the sea, between 500 and 1,000 fathoms, seem to be inhabited characteristically by silvery and sometimes reddish animals. That *Regalecus* normally dwells in deep water is evident from its thin bones and fragile watery flesh, a condition not found in surface fishes. It is useless for food purposes.

THE MOONFISH

The moonfish (*Lampris luna*), wholly different in appearance, is systematically close to *Regalecus*, the evidence of relationship resting upon the peculiar structure of the jaws. It, too, is an oceanic fish, and though it probably lives somewhat below the surface, down to around 100 fathoms, the body structure is not typically deepsea. It is an excellent food fish, but is only rarely caught on hook and line.

Although the moonfish may be six feet long, its toothless mouth is adapted for capturing only the smaller fry of the sea and practically nothing is known about its manner of living. Almost circular in shape, it weighs up to about 600 pounds. The chief haunts of the fish are the warm waters of the oceans; but it ranges as far north as Newfoundland and Finland in the summer.

OCEAN SUNFISH

The giant ocean sunfish (*Mola mola*), which grows to a length of ten feet, a height of twelve feet, and a weight of more than a ton, is a surface dweller, its name being derived from a habit of lying on its side, apparently basking in the sun. Like the moonfish, it is confined to warm and temperate seas, but there the resemblance ends, for *Lampris* belongs to the more primitive group of soft-rayed fishes, while *Mola* is a highly specialized member of the Plectognathi, an assemblage of fishes that includes puffers, trunkfishes, and trigger fishes.

It is armored with a thick layer of hard gristly material beneath the skin, almost impervious to harpoons. It is harmless, and sometimes allows a boat to come right alongside with no attempt to escape. The flesh, rarely eaten, is tough and tasteless.

Unlike the oar fish and moonfish, very young specimens of *Mola* are reasonably common though not easily recognized. They are tiny motes adorned with an array of sharp little spines, which gradually disappear as the larva grows into a sunfish.

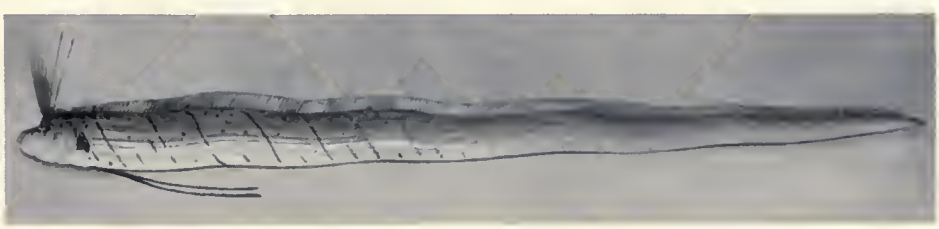
The related porcupine fishes possess a coat of spines as adults, and many of the puffers are covered, or partly so, with very small prickles, a further indication that the development of egg and larva tends to reveal the evolutionary past of the individual.

Our fourth model, of the truncated or oblong sunfish (*Ranzania truncata*), is no giant—its maximum length is about two feet—but it provides an interesting contrast to *Mola*. Both of these fishes belong to the same family (Molidae), and although *Ranzania* is a much smaller creature, its relation to the giant sunfish is clear. The most obvious differences are the smaller size and the proportionately longer body of *Ranzania*. Both species appear to have had their tails chopped off, and their mouths and heads are much alike. The distribution of the smaller species is similar to that of *Mola*.

The new models, as well as the sketches of the larva, are the work of Staff Taxidermist Leon L. Pray.

OCEAN SUNFISH OR MOLA

This odd creature grows to as much as 10 feet in length, 12 feet in height, and weighs in excess of 2,000 pounds.



OAR FISH OR RIBBONFISH (REGALECUS)

Its dimensions, up to 50 feet in length although only about 10 inches high, together with the crest-like fin-rays on its head and the flaming red ridge running the entire length of its back provide clues to the persistence of stories about sea serpents.

Trustee Armour Returns

Captain Lester Armour, U.S. Navy, a Trustee of the Museum, has been released from duty and returned to Chicago. Going into war service with the rank of Lieutenant Commander, he was successively promoted to Commander and then Captain. He was awarded the bronze star medal for his work in organizing and directing special military activities before and after D-day for the invasion of the European continent.

Visiting Hours Change

The Museum visiting hours, which have been 9 A.M. to 5 P.M. daily during the autumn months, will change to the winter schedule —9 A.M. to 4 P.M.—on November 1. These hours will continue until February 28.

Chicago Natural History Museum

FOUNDED BY MARSHALL FIELD, 1893

Roosevelt Road and Field Drive, Chicago

TELEPHONE: WABASH 9410

THE BOARD OF TRUSTEES

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THE BULLETIN

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PAUL O. MCGREW.....*Acting Chief Curator of Geology*
KARL P. SCHMIDT.....*Chief Curator of Zoology*

MANAGING EDITOR

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Members are requested to inform the Museum promptly of changes of address.

THREE CONTRIBUTORS ELECTED

Dr. Ruth Marshall, Professor of Biology at Rockford College, Rockford, Illinois, and Dr. Julian A. Steyermark, Assistant Curator of the Herbarium at this Museum, have been elected by the Board of Trustees to the membership classification designated as "Contributors" to the Museum. This membership classification includes all persons whose gifts in funds or materials for the collections range between $1,000 and $100,000. Their names are inscribed in perpetuity on an honor roll in the Museum.

Also elected, posthumously, was Judge R. Magoon Barnes, of Lacon, Illinois, whose death was reported in the last BULLETIN.

Dr. Marshall presented a comprehensive collection of water mites of high importance to scientific research. She has also been appointed to an honorary post on the staff of the Department of Zoology as Research Associate in the Division of Insects, in recognition of her achievements in her chosen field of science.

Dr. Steyermark recently returned to his post after several years' absence serving the government on important medico-botanical projects in South America for war purposes as an agent of the Foreign Economic Administration. He collected in spare time many thousands of plants valued at several thousand dollars which he has presented to the Museum.

Judge Barnes bequeathed the Museum an important collection of some 39,000 birds' eggs. He was an honorary member of the staff as Curator of Birds' Eggs.

Staff Notes

Corporal Bryan Patterson and Corporal William Beecher were released from service in the Army in October. Corporal Patterson, Curator of Paleontology, will return to his Museum post after a brief vacation in California. Corporal Beecher, formerly an Assistant in the Department of Zoology, has been assigned to the N. W. Harris Public School Extension of the Museum.

Corporal Patterson was in the thick of action on the French and Belgian fronts, was wounded, returned to action, awarded a citation, taken prisoner by the Nazis when he and his men were hopelessly outnumbered on a patrol mission, and released when the main American force swept over the area where he was held captive.

Corporal Beecher, attached to a combat medical unit, participated in the taking of Rendova, and was engaged in malaria control work on Guadalcanal, the Russells, New Georgia and Bougainville. In spare time he collected many zoological specimens which he sent to the Museum, and made a notable series of paintings of natural history features of the islands, some of which have now been published in newspapers and an encyclopedia.

Lieutenant Loren P. Woods, U.S.N.R., Assistant Curator of Fishes, is in Japan for work on Japanese fisheries for the American military government.

Mrs. Harold Florsheim has become a volunteer assistant on the staff of the Department of Anthropology.

Miss Bernice Kaplan, volunteer in the Department of Anthropology, has been awarded a Museum fellowship by the University of Chicago. Her special research will be in creation of new kinds of exhibits.

Museology Course

A course in museology for the graduate students of anthropology in the University of Chicago is being given by the Museum's anthropological staff for the third season. This course serves as an interneship for training students to become competent museum curators.

Edward H. Bean

The sad news of the death on September 5 in an automobile accident of Edward H. Bean, Director of the Chicago Zoological Society's zoo in Brookfield, was noted with deep regret at the Museum. Mr. Bean had many friends on the staff of this Museum. He was largely responsible for the extremely cordial relations maintained between the zoo and the Museum, which have resulted in the acquisition of many valuable specimens for the Museum collections.

THE MUSEUM HONOR ROLL

Now in the Nation's Service

Army

DR. JOHN RINALDO, Associate, Southwestern Archaeol.—Staff Sgt.
DR. SHARAT K. ROY, Curator, Geol.—Capt.
D. DWIGHT DAVIS, Curator, Anat. and Osteol.—Corp.
EMMET R. BLAKE, Asst. Curator, Birds—Special Agent, War Dept.
RUPERT L. WENZEL, Asst. Curator, Insects—Capt.
HENRY S. DYBAS, Assistant, Insects—Sgt.
HENRY HORBACK, Assistant, Geol.—S. Sgt.
JAMES C. MCINTYRE, Guard—2nd Lt.
RAYMOND J. CONNORS, Guard—Pvt.
FRANK J. DUTKOVIC, Janitor—Pvt.

Navy

SAMUEL INSULL, JR., Trustee—Lieut. Comdr.
JOSEPH NASH FIELD, Trustee—Lieut.
COLIN CAMPBELL SANBORN, Curator, Mammals—Lieut. Comdr.
DR. ALEXANDER SPOEHR, Curator, N. Amer. Ethnol.—Lieut.
LOREN P. WOODS, Asst. Curator, Fishes—Lieut. (j.g.)
JOHN W. MOYER, Taxidermist—Ch. Specialist (Bur. Aeronautics)
JAMES H. QUINN, Chief Preparator, Paleontol.—Metalsmith 2C
PATRICK T. MCENERY, Guard—Master Gunner
NICHOLAS REPAR, Printer—Aviation Machinist's Mate 1C.
HERBERT NELSON, Painter—Painter 1C.
ELIZABETH BEST, Guide-Lecturer—Lieut. (j.g.), WAVES
MARIE B. PABST, Guide-Lecturer—Lieut. (j.g.), WAVES

Marine Corps

MELVIN A. TRAYLOR, JR. Associate, Birds—Capt.

Coast Guard

M. C. DARNALL, JR., Guard—Lieut. (j.g.)
JOHN MCGINNIS, Guard—Ch. Boatswain's Mate

Other Services

RUDYERD BOULTON, Curator, Birds—Staff of Office of Strategic Services
BRYANT MATHER, Asst. Curator, Mineralogy—Civilian Worker, Corps of Engineers, U.S. Army
DR. C. MARTIN WILBUR, Curator, Chinese Archaeol. and Ethnol.—Staff of Office of Strategic Services

Died in Service:

THEODORE ROOSEVELT, Trustee—Brig. Gen., U.S.A.
GEORGE JAHRAND, Guard—Ch. Machinist, U.S.N.

Returned to Museum Service:

LESTER ARMOUR, Trustee—Captain, U.S.N.R.
GEORGE A. RICHARDSON, Trustee—Lt. Col., U.S.A.
CLIFFORD C. GREGG, Director—Colonel, U.S.A.
WILLIAM BEECHER, Asst. Harris Extension—Corp., Army
BRYAN PATTERSON, Curator, Paleontology—Corp. Army
MORRIS JOHNSON, Carpenter—Carpenter's Mate 1C., U.S.N.R.
LLEWELYN WILLIAMS, Curator of Economic Botany—special service for U.S. Government
DR. JULIAN A. STEYERMARK, Asst. Curator, Herbarium—field work for Foreign Economic Administration

FIELDIANA

Since the name of Field Museum of Natural History was changed to Chicago Natural History Museum in December, 1943, until now it has not been practical to make the called-for change in the name of the Museum's technical publications. Henceforth, these publications of the Museum will appear under the general title of *Fieldiana*, with division as formerly into five series—Anthropology, Botany, Geology, Zoology, and Technique. These series will be continuous with the volumes already published and will carry their successive numerical designations as if no change of name had been made.

The new name will be used neither for the concluding parts of volumes now partly published nor for additions to sets devoted to a single subject, as, for example, the *Flora of Peru*.

Technical Publications Issued

The following technical publications have been issued by the Chicago Natural History Museum Press during the last two months:

Fieldiana, Zoology, Vol. 31, No. 1. *A New Rodent from Dutch New Guinea.* By Wilfred H. Osgood. September 19, 1945.

Fieldiana, Zoology, Vol. 31, No. 2. *Malacological Notes—IV.* By Fritz Haas. September 19, 1945.

Fieldiana, Zoology, Vol. 31, No. 3. *Some Remarkable Shells of a South American Fresh-Water Mussel.* By Fritz Haas. September 19, 1945.

Fieldiana, Anthropology, Vol. 36, No. 1. *Pottery from the Aleutian Islands.* By George I. Quimby. September 19, 1945.

Fieldiana, Geology, Vol. 10, No. 1. *A New Turtle from the Paleocene of Colorado.* By Karl P. Schmidt. September 19, 1945.

Geological Series, Vol. 9, No. 3. *Some Early Miocene Carnivores.* By Elmer S. Riggs. October 4, 1945.

FISHING DOGS

By ALFRED C. WEED
RETIRED CURATOR OF FISHES

During the Museum's Rawson MacMillan Expedition of 1926 a brief stop was made at Battle Harbor, Labrador. It is a surprising place. Two rocky islands, Battle Island and Grand Caribou, lie on opposite sides of a deep channel so narrow that freight steamers coming in to load dried fish have to ask for help to turn around before they can leave. The farther end of the channel is so narrow and crooked that it is passable only for small ships—at high tide. Even our ninety-foot schooner *Bowdoin* required careful conning to go out through the "back door."

At the "front" entrance of Battle Harbor is a smooth ledge of rock that extends across nearly half the channel. It was on this ledge that I first saw dogs make a business of fishing. The village lies on both sides of the channel and its dog population was much larger than the human. Every morning we saw a great mob of wolf-like Eskimo dogs gathering on the low shore of Grand Caribou Island. Led by one of the largest, the pack of dogs plunged into the water and swam across the channel. After a hasty shake on the bank, each dog waded out into the water until little more than its head and neck remained visible. Soon one and then another would plunge its head beneath the water, to come up with a fish in its jaws. One or two quick gulps (they had to be quick to save the fish from other grasping mouths) finished the fish and the dog was ready to fight off intruders seeking the next fish.

Since these dogs did not work during the summer, their owners saw no reason why they should be fed—they had to gather their own food. Much of their living came from the refuse under the tables where fish were dressed for salting. They caught sculpins and flounders in the shallow water. On the hills they hunted mice and occasionally surprised a bird or found a nest of eggs hidden in the moss. As these dogs wandered over the tundra in late summer and through part of the winter they found the ground covered with blueberries and crowberries, with which they managed to fill their stomachs.

JUDGES SELECTED FOR SALON OF NATURE PHOTOGRAPHY

The Chicago Nature Camera Club has announced the names of the five judges for the First Chicago International Salon of Nature Photography which it will present at the Chicago Natural History Museum.

TOAD TRILLING

By Charles E. Mohr, of Philadelphia. This photograph, one of those awarded a blue ribbon in the Museum's International Photographic Exhibit in the autumn of 1943, in connection with the institution's Fiftieth Anniversary, is a good example of the type of material desired in the forthcoming Nature Salon.

The judges are: B. D. Holley, of Downers Grove, Ill., an associate of the Photographic Society of America; A. H. Longwell, Chicago, professional photographer; James H. Burdett, Garden Editor of *The Chicago Sun*, and representative of the Chicago Horticultural Society; and Dr. Paul O. McGrew, Acting Chief Curator of Geology, and Karl P. Schmidt, Chief Curator of Zoology on the Museum's staff.

Entries for the exhibit are being accepted now, and all must be received by January 12 to be eligible for consideration. The exhibition will be held in Stanley Field Hall of the Museum from January 28 to February 28 inclusive. Entries may be addressed to the Salon in care of the Museum.

Photographs and color slides in six classifications are desired:

Plant life—flowers, trees, shrubs, fungi, etc. (but *not* gardens in this division).

Animal life—mammals, birds, insects, reptiles, tracks, etc.

Scenery—with particular emphasis on geological aspects and natural phenomena.

Gardens—especially Victory Gardens and their products.

Anthropology—ethnological and archaeological subjects; primitive man, native habitations, sites or ancient cultures and civilizations, etc.

Color slides—any subjects in the foregoing classifications.

The entry fee is $1, for which a maximum of 4 prints and 6 color slides may be submitted; make checks and money orders payable to the Chicago Nature Camera Club.

A number of accepted pictures will be reproduced in the *Journal of the Photographic Society of America*, and elsewhere.

Prizes are to be awarded by the Chicago Nature Camera Club and the Chicago Horticultural Society.

CHRISTMAS SUGGESTIONS THAT WILL SAVE YOU TIME AND EFFORT, AND CHARM GIFT RECIPIENTS

The burden of much Christmas shopping and the preparing of many packages can be eased by using the services that Chicago Natural History Museum offers:

(1) Christmas Gift Memberships

If you will send to the Director the name and address of the person you desire to remember with a Museum membership, together with your remittance to cover membership fee or dues, the Museum will handle all further details. For your convenience a CHRISTMAS GIFT MEMBERSHIP ORDER FORM is enclosed. Additional copies of this form are available on request.

An attractive Christmas card notifying the recipient that through your generosity he has been elected a Member of the Museum, will be sent together with membership card and information concerning privileges as a Member, (and certificate in the case of Life and Associate Members).

The recipient of a Museum membership will be most enthusiastic over a gift so individual and distinctive.

(2) Museum Book Shop Gifts

The Book Shop is prepared to furnish books, endorsed for scientific authenticity by members of the Museum staff, for both adults and children. You are invited to browse in the Book Shop during part of your next visit to the Museum.

Where desired, the Book Shop will handle mail and telephone (WABash 9410) orders, and will undertake all details in connection with wrapping, and the dispatching of gift purchases to the designated recipients, together with such forms of greeting as the purchaser may specify.

LECTURE TOURS ON WEEKDAYS, NOVEMBER AND DECEMBER

Conducted tours of exhibits, under the guidance of staff lecturers, are made every afternoon at 2 o'clock, except Sundays and certain holidays. On Mondays, Tuesdays, Thursdays, and Saturdays, general tours are given, covering all departments. Special subjects are offered on Wednesdays and Fridays; a schedule of these follows:

November

Fri., Nov. 2—Trailing Indians—Arrival of Man in the New World (*Emma Neve*).

Wed., Nov. 7—Trees in Winter (*Miriam Wood*).

Fri., Nov. 9—The Near East—Egypt and Babylonia (*Emma Neve*).

Wed., Nov. 14—Giants—Large Animals and Plants (Prehistoric and Modern) (*Miriam Wood*).

Fri., Nov. 16—The Work of Museums (*Emma Neve*).

Wed., Nov. 21—Native American Foods (*Miriam Wood*).

Fri., Nov. 23—Animals at Home (*Mrs. Roberta Cramer*).

Wed., Nov. 28—Adapt or Become Extinct—Life from Prehistoric Times to the Atomic Age (*Emma Neve*).

Fri., Nov. 30—Weaving Through the Ages (*Mrs. Roberta Cramer*).

December

Wed., Dec. 5—Fragments of Eternity—Gem Stones (*Mrs. Roberta Cramer*).

Fri., Dec. 7—Animals in Winter (*Miriam Wood*).

Wed., Dec. 12—Ancient Winters—Effect of Climate on Man in the Stone and Bronze Ages (*Emma Neve*).

Fri., Dec. 14—Fine Feathers and Their Uses (*Mrs. Roberta Cramer*).

Wed., Dec. 19—Wild West—Western U. S. from Prehistoric to Modern Indian Days (*Emma Neve*).

Fri., Dec. 21—Christmas Greens (*Miriam Wood*).

Wed., Dec. 26—Facts and Fantasies—Solved and Unsolved Mysteries in Natural History (*Mrs. Roberta Cramer*).

Fri., Dec. 28—At Home in the North—Eskimo Life (*Emma Neve*).

GIFTS TO THE MUSEUM

Following is a list of some of the principal gifts received during the last two months:

Department of Botany

From: Mrs. James Bonner, Pasadena, Calif.—65 herbarium specimens, Mexico; A. F. A. Lamb, Belize, British Honduras—31 herbarium specimens, British Honduras; Miss Sophia Prior, Chicago—75 herbarium specimens, Massachusetts; Prof. Maximino Martinez, Mexico City—47 specimens of pines, Mexico; George L. Fisher, Houston, Tex.—50 herbarium specimens, Texas and Mexico; Harold B. Louderback, Argo, Ill.—91 specimens of algae, Indiana and Missouri; Dr. M. S. Doty, Stanford University, Calif.—87 specimens of algae, Oregon and California; Dr. H. L. Blomquist, Durham, N. C.—71 specimens of algae, Puerto Rico and North Carolina; Robert Runyon, Brownsville, Tex.—69 specimens of algae, Texas; Dr. Walter Kiener, Lincoln, Neb.—117 specimens of algae, Jalisco, Nebraska, and Colorado; Dr. Delzie Demaree, Monticello, Ark.—72 specimens of algae, California; Museo Nacional, San José, Costa Rica—120 herbarium specimens, Costa Rica.

Department of Geology

From: T. H. McAllister, Bowling Green, Ky.—9 specimens of rock, Canada.

Department of Zoology

From: Chicago Zoological Society, Brookfield, Ill.—a baby kudu, a chimpanzee, a giraffe head, 2 monkeys, and a parrot; Herbert Ramstadt, Waukegan, Ill.—an Indian skull, Colorado; Lincoln Park Zoo, Chicago—a leopard; Harold H. Postel, Chicago—a warbler, Chicago; E. Ricketts, Robles del Rio, Calif.—177 fishes, British Columbia; William J. Beecher, Chicago—3 birds, 2 lizards, and a frog, New Caledonia; M. Laenen, Molenbeek, Belgium—a chickadee and a bird painting; Harold Zapel, Chicago—a red-eyed vireo, Chicago; D. H. Boyd, Chesterton, Ind.—a Lincoln sparrow, Indiana.

NEW MEMBERS

The following persons became Members of the Museum during the period from August 6 to October 15:

Contributors

R. Magoon Barnes*, Dr. Ruth Marshall, Dr. Julian A. Steyermark.

Life Members

Marshall Field, Jr.

Associate Members

George Barr, Carl P. Clare, Charles H. Dornbusch, Mrs. Harley T. Foote, Mrs. Flora Rassweiler Harders, Morris I. Kaplan, William J. MacKenzie, A. W. Weissbrenner.

Annual Members

Mrs. John T. Agar, R. D. Allbright, Arthur A. Baer, Mrs. Lawrence A. Barrett, O. D. Bast, Herbert J. Bielefeld, Joseph F. Bigane, E. D. Black, Dr. N. Lionel Blitzsten, Elbert L. Boley, Mrs. John J. Borland II, Mrs. Chester T. Bradford, John L. Brichetto, Mrs. William S. Broude, Richard McP. Cabeen, Miss Mizpah Chenier, Richard T. Coyne, N. R. Dispenza, J. E. Dwyer, David B. Eisenberg, Mrs. Fred A. Emery, A. H. Fensholt, Irving H. Fishlove, Mrs. W. Lynne Fleming, Bruce W. Glenn, Orr Goodson, Casimir Griglik, B. Brower Hall, J. E. Hobson, Dr. M. S. Horwitz, H. R. Hurvitz, C. A. Jackett, Henry J. Kohlmann, C. L. Laven, Cecil Martin, Mrs. Edwin Dudley Martin, J. L. McCaffrey, John P. Mentzer, George S. Milnor, P. G. Morris, John E. Mossman, Edward G. Muir, J. C. Nauman, Burritt A. Parks, H. M. Pier, Mrs. G. V. Pontius, Nathan N. Powell, J. H. Pratt, Max Schlossberg, M. W. Spitz, Alexander F. Stephen, Harry C. Straus, Emil Tarnopol, Paul H. Tartak, William Waller, Jr., Samuel A. Wasserman, Mrs. Mary Lavelle West, Mrs. Maida B. Wheeler, Miss Fanny B. Wilson, Rev. Walter S. Wood.

* Deceased.

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